Lower Joseph Project

Wildlife Report

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Introduction

This analysis summarizes the terrestrial wildlife species found in the project area and the effects of the alternatives on these species. Rather than addressing all wildlife species, discussions focus on LRMP management indicator species (MIS), threatened, endangered and sensitive (TES) species, LRMP featured species, and landbirds (see individual species lists below). The existing condition is described for each species, group of species, or habitat. Direct, indirect and cumulative effects of alternatives are identified and discussed. For more details on the project area and project alternatives, see chapter 2 of the FEIS.

Management Indicator Species (MIS)

The National Forest Management Act (NFMA) directs the Forest Service to provide habitat to maintain viable populations of existing native and desired non-native vertebrate species. Management Indicator Species (MIS) were selected for emphasis in planning, and are assessed during forest plan implementation in order to determine the effects of management activities on their populations and the populations of other species with similar habitat needs. The amount and quality of habitat is used as a proxy for determining the effects of projects on MIS. Table 1 lists the terrestrial species selected as MIS in the Wallowa-Whitman LRMP. All of these MIS have habitat and likely occur in the planning area though habitat for the American marten is limited and presence of this species within the planning area is unknown.

Table 1. Management Indicator Species identified in the Wallowa-Whitman LRMP.

Species	**Representing**	**Habitat Description**	**Habitat Present in Analysis Area**	**Species Present in Analysis Area**
Primary cavity excavators (1)	Dead & defective wood habitat	Snags and logs	Yes	Yes
Pileated woodpecker	Old growth and mature forests	Closed canopy, late-seral subalpine, montane and lower montane forests	Yes	Yes
American (pine) marten	Old growth and mature forests	Closed canopy, late-seral subalpine and montane forests	Limited	Unknown
Northern Goshawk	Old growth and mature forests	Subalpine and montane forests, lodgepole pine, post-fire habitat	Yes	Yes
Rocky Mountain Elk	Species commonly hunted	Cover and forage	Yes	Yes

(1)Northern flicker; black-backed, downy, hairy, Lewis', three-toed, and white-headed woodpeckers; red-naped and Williamson's sapsuckers; black-capped, chestnut-backed, and mountain chickadees; and pygmy, red-breasted, and white-breasted nuthatches.

Viability of MIS is being assessed using the historical range of variability (HRV) concept; comparing current amounts and distribution of habitat to historical conditions (Wisdom et al. 2000, Suring et al. 2011). Scientists assume that species are more likely to persist into the future under the conditions that remain most similar to the conditions that they persisted in during the past (Landres et al. 1999, Samson et al. 2002). By managing habitat within HRV it is assumed that adequate habitat will be provided because species survived those levels of habitat in the past to be present today. Thus, if we manage current habitats within the range of historic variability, we are likely to do an adequate job of maintaining population viability for those species that remain. The further current habitat conditions to from HRV, the more likely it is that population viability will be compromised.

Vegetation data used to assess current habitat conditions for American marten and Pileated woodpecker are from the project vegetation layer. The viability analysis completed for the DEIS of the Wallowa Whitman NF is used as reference for habitat conditions within the project area as well as cumulative effects on the entire Forest (Wales,et al. (2011). Estimates of HRV were derived for the DEIS (Countryman and Justice (2010). HRV for dead wood is from distribution histograms in DecAID (Mellen-McLean, Marcot et al. (2012). Current conditions of snag densities are from GNN data (LEMMA).

Existing Condition habitat departure.

In general, as compared to the RV, in the Moist Forest types the LJCRP area is low in the area of smaller trees, and is currently at the low end of large tree closed canopied habitat. Generally there is an abundance of medium and large-medium trees (10-20” dbh), and habitat >10” dbh with open canopies (<60% canopy closure) as compared to the range of variation.

In the dry forests the LJCRP is below the range of variation in large tree, open canopied habitats, and above the range of variation in the medium and large-medium (10-20” dbh), closed canopied structural stages.

Table 2 – Percent vegetation within different PVG/Structural stages for the existing condition and each alternative and including the HRV.

						HRV		
PVG	Canopy*	Tree size (dbh ")	EC_A1% **	A2%	A3%	Low %	Average %	High %
Moist	Closed	0-10	-	-	-	17	23	30
Moist	Open	0-10	22	22	22	5	13	22
Moist	Closed	10-15	13	8	9	5	9	12
Moist	Open	10-15	14	13	13	6	10	13
Moist	Closed	15-20	15	8	9	10	13	17
Moist	Open	15-20	13	19	17	2	4	7
Moist	Closed	>=20	17	17	17	19	24	29
Moist	Open	>=20	7	14	13	2	4	7

Dry Douglas Fir	Closed	0-10	1	1	1	-	2	5
Dry Douglas Fir	Open	0-10	20	20	20	10	17	23
Dry Douglas Fir	Closed	10-15	28	17	20	-	0	2
Dry Douglas Fir	Open	10-15	7	7	7	0	3	6
Dry Douglas Fir	Closed	15-20	20	15	17	-	2	4
Dry Douglas Fir	Open	15-20	8	15	13	2	6	10
Dry Douglas Fir	Closed	>=20	13	11	11	0	10	22
Dry Douglas Fir	Open	>=20	2	13	11	43	60	79
Dry Grand Fir	Closed	0-10	1	1	1	0	6	12
Dry Grand Fir	Open	0-10	9	9	9	13	21	30
Dry Grand Fir	Closed	10-15	38	17	29	-	2	4
Dry Grand Fir	Open	10-15	5	5	5	1	4	7
Dry Grand Fir	Closed	15-20	19	14	19	(0)	3	7
Dry Grand Fir	Open	15-20	6	21	12	4	8	13
Dry Grand Fir	Closed	>=20	22	22	20	0	11	22
Dry Grand Fir	Open	>=20	1	11	5	28	44	61
Dry Ponderosa Pine	Closed	0-10	1	1	1	-	1	5
Dry Ponderosa Pine	Open	0-10	18	18	18	13	23	33
Dry Ponderosa Pine	Closed	10-15	23	16	18	-	0	1
Dry Ponderosa Pine	Open	10-15	16	15	15	1	4	7
Dry Ponderosa Pine	Closed	15-20	22	13	15	-	0	2
Dry Ponderosa Pine	Open	15-20	8	13	12	1	5	8
Dry Ponderosa Pine	Closed	>=20	11	10	10	-	6	15
Dry Ponderosa Pine	Open	>=20	2	13	10	48	61	76

Xeric Pine	Closed	0-10	-	-	-	-	1	4
Xeric Pine	Open	0-10	1	1	1	23	38	53
Xeric Pine	Closed	10-15	19	6	7	-	1	4
Xeric Pine	Open	10-15	25	25	25	-	4	10
Xeric Pine	Closed	15-20	13	18	19	-	1	3
Xeric Pine	Open	15-20	31	33	32	-	4	9
Xeric Pine	Closed	>=20	4	3	3	-	3	9
Xeric Pine	Open	>=20	7	14	13	25	48	71

*canopy closure for Dry PVG's <40%=open; >40%=closed; Moist PVG <60%=open, >60%=closed
EC=Exisiting Condition, A1=Alt.1, A2=Alt.2,A3=Alt.3

Cavity Excavation Birds – **Dead and defective wood habitat**

Primary cavity excavating birds (woodpeckers) depend on standing and down dead wood for nest, roosting, and foraging. By providing adequate dead wood habitat for these birds, it is assumed that adequate habitat will be provided for other species that rely on dead wood for all or part of their life histories.

Because these MIS where selected to represent dead and defective wood habitat, this analysis and discussion focuses primarily on that habitat component. Additional information on cavity-excavating birds' habitat associations, distribution and life history requirements is summarized in Mellen-McLean (2012a).

A few of the MIS woodpeckers are discussed in more detail due to conservation concerns (Table 2). The Pileated woodpecker is also MIS for old-growth habitats and further discussed in the Old-Growth Habitat section of this document. More detailed discussion of White-headed and Lewis' Woodpeckers is found in the Sensitive Species section of this document.

Table 3. Conservation status of cavity-nesting MIS

Species	USFS Sensitive	NatureServe Ranks[1]	
		Global	OR
Black-backed woodpecker		G5	S3
Downy woodpecker		G5	S4
Hairy woodpecker		G5	S4
Lewis's woodpecker	Yes	G4	S2S3
Northern flicker		G5	S5
Northern three-toed woodpecker		G5	S3
Red-naped sapsucker		G5	S4
White-headed woodpecker	Yes	G4	S2S3
Williamson's sapsucker		G5	S4B S3N
Pygmy nuthatch		G5	S4
Red-breasted nuthatch		G5	S5
White-breasted nuthatch		G5	S4
Black-capped chickadee		G5	S5
Chestnut-backed chickadee		G5	S5
Mountain chickadee		G5	S4

[1] NatureServe Ranks: (NatureServe 2010)

- G5 or S5 – Widespread, abundant, secure
- G4 or S4 – Apparently secure
- G3 or S3 – Vulnerable
- G2 or S2 – Imperiled

In general, populations of cavity nesting birds have declined across the Blue Mountains compared to historical conditions, primarily due to reductions in the numbers of large snags (Wisdom, Holthausen et al. 2000). However, of the cavity excavating MIS, Breeding Bird Surveys in Oregon have only detected a significant decrease in populations of the northern flicker between 1966 and 2010 (Sauer, Hines et al. 2011).

Current LRMP direction, as amended by the Eastside Screens, is to maintain snags at 100% of biological potential for all woodpecker species that occur on the Forest throughout the stand rotation. This equates to 2.25 snags/acre ≥12" dbh and 0.14 snags/acre ≥ 20" dbh. Snags can be averaged over an area no larger than 40 acres. Snags should be left in a clumped distribution.

Rose et al. (2001) report that results of monitoring indicates that the biological potential models are a flawed technique (page 602). New information about the ecology, dynamics, and management of decayed wood has been published since then, and the state of the knowledge continues to change. However, until the LRMP is amended to reflect the new science, 100% biological potential is the minimum number of snags that need to be maintained through the life of the stand rotation.

Integration of the latest science is incorporated into this analysis using DecAID Advisor (version 2.2) (Mellen-McLean et al. 2012) which is an internet-based summary, synthesis, and integration (a "meta-analysis") of the best available science: published scientific literature, research data, wildlife databases, forest inventory databases, and expert judgment and experience. In addition to data showing wildlife use of dead wood, DecAID also contains data showing amounts and sizes of dead wood across the landscape based on vegetation inventory data.

Data from unharvested plots are assessed separately and these data can be used as a reference condition to approximate HRV of dead wood. There is debate among professionals on the impact fire exclusion has on stands relative to HRV of dead wood. One caveat to using these data is, "On the eastside in particular, current levels of dead wood may be elevated above historical conditions due to fire suppression and increased mortality, and may be depleted below historical levels in local areas burned by intense fire or subjected to repeated salvage and firewood cutting"(Mellen-McLean, Marcot et al. 2012). Even with this caveat, the data are used in this analysis because: they are still some of the best data available to assess HRV of dead wood, even in eastside dry forests; they are the only available data showing distribution and variation in snag and down wood amounts across the landscape; the data from unharvested stands are in the range of other published data on HRV of dead wood even in the drier vegetation types. For a full discussion see HRV Dead Wood Comparison (Mellen-McLean et al. 2012)

A distribution analysis (http://www.fs.fed.us/r6/nr/wildlife/decaid-guide/distribution-analysis-green-tree.shtml) was used to determine how close current conditions for dead wood on the landscape match reference conditions. Existing conditions for down wood were derived by using Gradient Nearest Neighbor (GNN) data (LEMMA). GNN produces pixel-based maps with associated snag and down wood data. These maps provide the direct data necessary to construct "current situation" histograms. GNN uses the same data that were used to develop the distribution histograms for DecAID. For more information see (Ohmann 2002)

The analysis area for the distribution analysis encompasses both the Upper and Lower Joseph watersheds (USFS lands only). The analysis area is large enough to meet the minimum analysis area size of approximately 12,800 acres per wildlife habitat type recommended by the authors of DecAID (Mellen-McLean et a. 2012).

The distribution analysis results are then compared to the needs of woodpecker species using tolerance levels and intervals (range between 2 tolerance levels) from DecAID (Table 4). A tolerance interval is similar to the more commonly used confidence interval but with a key difference: tolerance intervals are estimates of the percent of all *individuals* in the population that are within some specified range of values. In comparison, confidence intervals are estimates of *sample means* from the population of interest.

An example of use of a tolerance level is as follows. If the 50% tolerance level for snag density at pileated woodpecker nest sites in a specific wildlife habitat type is 7.8 snags/acre, the interpretation would be that 50% of nest sites used by pileated woodpeckers in that habitat have < 7.8 snags/acre and 50% of nest sites used by pileated woodpeckers have > 7.8 snags/acre.

Existing Conditions of Dead and Defective Habitat

The Ponderosa Pine – Douglas Fir (PPDF) and Eastside Mixed Conifer (EMC) wildlife habitat types (WHT) occur in the analysis area. These generally represent the Dry (PPDF) and Moist (EMC) potential vegetation groups. Results of the DecAID distribution analysis are displayed in Figure(s) 1 and 2. Tolerance levels for woodpeckers are displayed in Tables 4 and 5.

Interpretation for PPDF WHT
In the Ponderosa Pine/Douglas-fir Wildlife Habitat Type (PPDF WHT), the landscape is near or above reference conditions for densities of large snags (>20"), and for snags >10" in density classes < 8 snags/acre (Figure 1). There is less area lacking snags (0 snags/acre) than would be expected under reference conditions, and more area in the lower snag density classes. Most woodpecker species using this WHT should currently have an adequate amount of snag habitat on the landscape. The exception is those species using high densities of small snags in recent post-fire habitats (e.g., black-backed woodpecker). Large snag habitat for pileated woodpecker and Williamson's sapsucker is rare in this WHT both currently and with reference conditions.

Figure [1]. Comparison of HRV to current condition for snag density classes in the PPDF WHT portion of the LJCR Analysis Area. Figure A displays snags > 20” dbh; figure B displays snags > 10” dbh. 50% tolerance levels for wildlife species are displayed on figure A. 30, 50 and 80% tolerance levels for black-backed woodpeckers are displayed on figure B. HRV Reference condition derived from DecAID Figures PPDF_L.inv-14, PPDF_S.inv-14, and PPDF_O.inv-14; wildlife tolerance levels from Tables PPDF_S/L.sp-22 and PPDF_PF.sp-22 (Mellen-McLean et al. 2012).

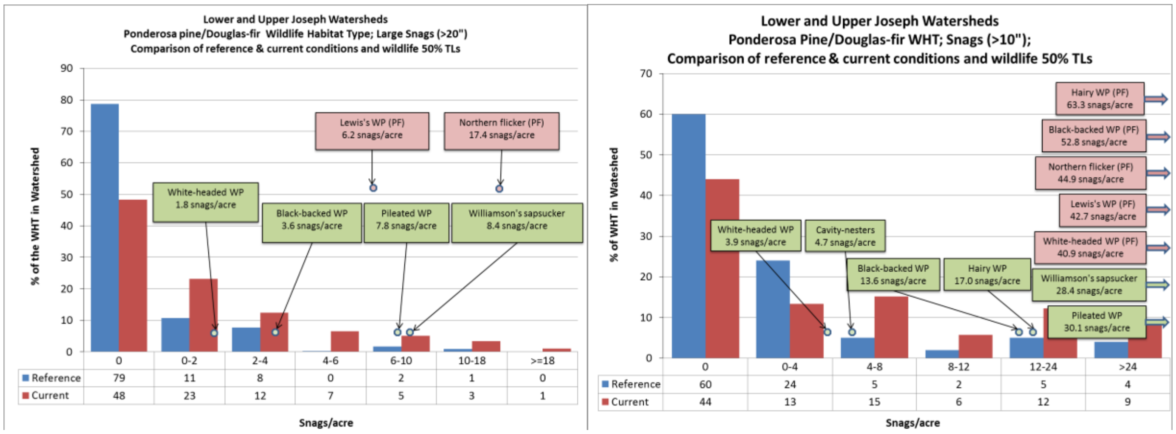


Table 4. Tolerance levels for woodpeckers occurring in the PPDF Wildlife Habitat Type (From DecAID Tables PPDF_S/L.sp-22 and PPDF_PF.sp-22, only species with adequate snag density data are listed).

Species	Snag density/acre for 30%, 50%, 80% tolerance levels			
	Green Forests		Recent Post-fire	
	>10” dbh	>20” dbh	>10” dbh	>20” dbh
Black-backed woodpecker	2.5, 13.6, 29.2	0.0, 1.4, 5.7	37.4, 52.8, 76.5	
Hairy woodpecker			39.2, 63.3, 100.0	
Lewis’s woodpecker			24.7, 42.7, 70.6	0.0, 6.2, 16.1
Northern flicker			25.0, 44.9, 83.1	2.2, 17.4, 39.6
White-headed woodpecker	0.0, 3.9, 11.9	0.5, 1.8, 3.8	22.2, 40.9, 68.3	
Williamson’s sapsucker	14.0, 28.4, 49.7	3.0, 8.4, 16.3		

Interpretation for EMC WHT

In the Eastside Mixed Conifer Wildlife Habitat Type (WHT), the landscape is deficit in snags density classes above 2 per acre for large (> 20” dbh) snags, as compared to reference conditions (Figure 2 A, B). Snag habitat for cavity-nesting birds is generally below reference conditions for densities of both large (>20”) and small (>10”) snags as more area is within the snag density class of 0 snags/acre than would be expected. In the higher density classes, especially the highest density classes, the area is currently below reference condition (figure 2A, B).

These snag density classes (in deficit) provide habitat above the 30% tolerance level for pileated woodpecker and Williamson’s sapsucker. Large snag habitat for those two species may be limiting in this WHT and the 2 woodpeckers may be limited to more productive sites in this WHT where snag densities are expected to be higher (Bull et al. 2007), (Ohmann and Waddell 2002)).

The amount of the landscape in the highest density classes for snags from unharvested stands (DecAID data) may be somewhat inflated due to an excess of dense stands with smaller trees susceptible to mortality than likely occurred historically. In addition, the data used in the calculation of reference conditions are from the late 1990s when spruce budworms were active in the Blue Mountains which created high levels of tree mortality.

Figure [2]. Comparison of reference condition to current condition for snag density classes in the EMC WHT portion of the Lower Joseph Analysis Area. Figure A displays snags > 20” dbh; figure B displays snags > 10” dbh. 50% tolerance levels for wildlife species are displayed on both figures. Reference condition derived from DecAID unharvested vegetation plots in the Blue Mountains (see analysis file); wildlife tolerance levels for green stands and post-fire habitat from Tables EMC_S/L.sp-22 and EMC_PF.sp-22 (Mellen-McLean et al. 2012). Current conditions from GNN data. (see analysis file)

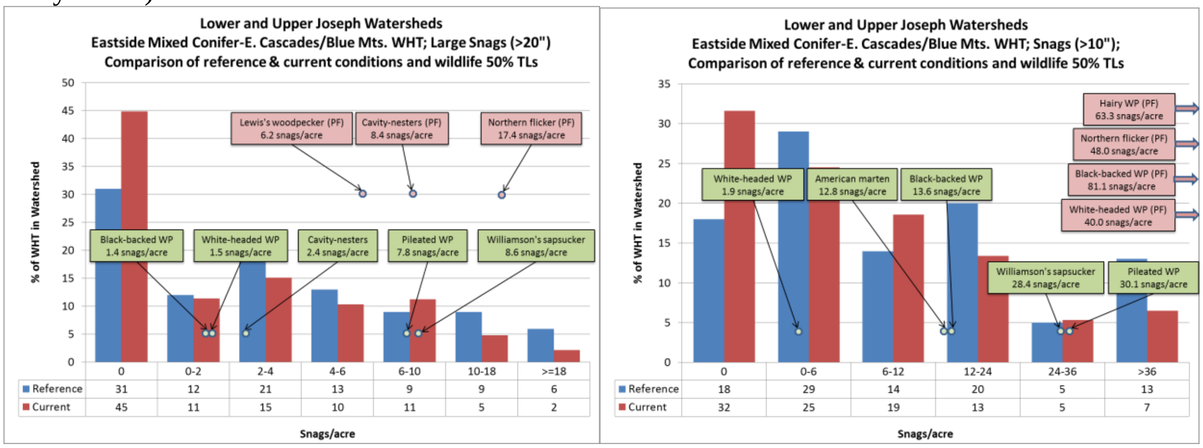


Table [5]. Tolerance levels for woodpeckers occurring in the EMC Wildlife Habitat Type] (From DecAID Table EMC_S/L.sp-22, only species with adequate snag density data are listed).

	Snag density/acre for 30%, 50%, 80% tolerance levels	
	Green Forests	
Species	**>10” dbh**	**>20” dbh**
Black-backed woodpecker	2.5, 13.6, 29.2	0.0, 1.4, 5.7
Pileated woodpecker	14.9, 30.1, 49.3	3.5, 7.8, 18.4
White-headed woodpecker	0.3, 1.9, 4.3	0.0, 1.5, 3.8
Williamson’s sapsucker	14.0, 28.4, 49.7	3.3, 8.6, 16.6
Pygmy nuthatch	1.1, 5.6, 12.1	0, 1.6, 4.0
American Marten	11.8, 12.8, 14.4	3.7, 4.0, 4.5

Environmental Effects on Dead and Defective Habitat

Snag habitat is currently adequate in the PPDF habitat type, and below reference conditions in the EMC habitat type. No snags are prescribed to harvested in any of the alternatives. However, it is likely that snag density will decline in areas treated due to safety, skid trails and other reasons.

Snag prescription : Commercial harvest and non-commercial thinning activities would retain existing snags greater than or equal to 12 inches DBH except where they create a safety hazard.

Mitigation measures –
Snags

Wild – 5

Retain all snags (dead trees) during harvest and stand improvement treatments except where they create and operational constraint (skid trail or skyline corridor) or an imminent operational safety hazard. Consider using skips, or the design of ‘clumps’ in the harvest units to avoid thinning in the vicinity of snags.

Wild – 6

Removal of danger trees within the RHCAs, Dedicated Old growth (MA15s), Goshawk PFAs and Marten habitat areas is restricted. When felled from within these dedicated areas, only that portion of the tree within the roadway of the road can be removed. Danger tree determinations would meet Forest Service Danger Tree Policy and Guidelines.

Wild – 7

Utilize prescribed fire lighting techniques to help retain all snags during prescribed burning operations. Larger snags are of great value to primary cavity excavators and not easily replaced if loss occurs due to burning.

Wild – 8

For larger snags (> 20 inches DBH) at higher risk due to heavy fuels accumulations at the base, pullback of fuels or alteration of lighting techniques may be necessary prior to prescribed burning.

Wild – 9

In moist forests, because we are deficient in large snags, and in areas with known pileated woodpecker nests, prior to prescribed burning, rake duff away from the base of large live old growth trees and large snags with accumulations of bark and duff and/or use other protection measures where economically viable and reasonable to do.

Wild – 10

Prescribed burning during active nesting period (e.g. May 20 or post leaf-out) for nesting landbirds will be coordinated with district or forest biologist.

Wild – 11

Road Management - To retain snags and reduce disturbance, currently closed roads that are needed for log haul, and other road closures included within the ROD, would be closed immediately after project implementation (harvest/thinning, and pile burning).

Down Wood, Woody Debris, and Large Logs

Wild – 12

In all treated areas the minimum woody-debris ground cover listed in Table WL-1 below would be retained through all phases of the project where they currently exist. Existing large down logs (logs greater than 12") would be retained during harvest and grapple piling activities. Standing dead trees within thinning units that present a safety hazard would be felled and left in place if the unit is deficient in woody debris.

Wild – 13

As part of the plan for retention of logs and snags, protection measures shall be used during prescribed underburning to reduce consumption of these large woody fuels needed for wildlife habitat and hydrologic stability.

Wild – 14

Large snags (>20" dbh) felled for safety reasons in RHCAs, MA15s, Goshawk PFAs, and marten habitat will be retained on site to contribute to coarse wood. During any prescribed burning, the objective is to retain these logs, use burning techniques that support retention of these structures.

Table WL-1 Forest Plan Standards for Down Woody Debris

Species	Pieces per acre	Minimum Diameter at Small End (inches)	Minimum Piece Length	Total Length feet/acre
Ponderosa Pine	3-6	12"	greater than 6 feet	20-40 ft.
Mixed Conifer	15-20	12"	greater than 6 feet	120-160 ft
Lodgepole Pine	15-20	8"	greater than 8 feet	120-160 ft

Alternative 1 –
Because no harvesting or prescribed fire will occur in Alternative 1, snag habitat will not be altered. Snags would not be reduced for operational reasons or consumed during prescribed burning as in either Alternative 2 or 3.

Stands containing larger structure trees would continue to provide snag and down wood habitat to mostly meet habitat requirements of some primary cavity nesters at least through the short-term (15-25 years). In the absence of stand replacement fires, snag densities and down wood levels would continue to increase. Stress in overstocked stands may lead to increased snag abundance. Stand replacing fires would reduce snag habitat for those PCE's associated with live closed canopied forests (e.g. pileated woodpecker), while increasing habitat for those PCE's associated with post-fire conditions (e.g. Lewis's woodpecker). Currently the abundance of post-fire habitat is below the RV within the project area.

Alternative 1 proposes to implement 52 miles of road closures, approved by past projects within the watershed. Road closures and decommissioning would reduce disturbance and limit access for firewood cutting and snag loss.

As no change to PCE habitat will occur from management activities, and there is a reduction in open roads from existing condition, PCE habitat will remain viable at the forest and at the project scale.

Alternative 2 and 3
Effects assume project design criteria Wild-1-Wild-16 (Appendix J) would be implemented. These mitigation measures include protection measures for large trees, large snags, down-logs during harvest and burning activities. Snags >=12" are only to be removed due to safety considerations. Harvest of large trees is allowed only in Alternative 2 and on approximately 5,100 acres, excluding areas within MA15s, PFA's, and cool-moist large tree – closed canopied forests.

The vegetation treatments proposed would negatively impact current and future dead and defective wood habitat. Harvest treatment is proposed on about 40% of the forested landscape. It can be assumed that within treatment areas there would be a reduction in snags and logs due to skid trails, landings, safety reasons and prescribed burning. Proposed activities (tree harvest and prescribed burning) are expected to help create habitat for primary cavity excavators (PCEs) that use open forests (e.g. white-headed woodpeckers) and reduce habitat for those PCEs using dense forests (e.g. pileated woodpeckers).

It is unknown how the prescriptions using the ICO (individual, clumps, and openings) may affect the future development of snags. In the 'clumps' which are left unharvested, natural snag creating mechanism such as density will remain and snags will continue to develop in both the short and long-term. However, in areas that are thinned 'individuals', snag creating mechanisms may be removed, thus at least in the short-term, natural snag creation may happen less often than in the current more dense stands.

Alternative 2 harvests more acres (21,300 acres) than Alternative 3 (13,300 acres), thus there is a greater reduction in snag and down-wood habitat elements in Alternative 2 due to safety and placement of skid trails, landings, etc. Even when not prescribed for removal, research has found that thinning like treatments resulted in losses of pre-treatment snags (Harrod et al. 2009, Agee 2002).

The vegetation treatments proposed would negatively impact current and future dead and defective wood habitat. Harvest treatment is proposed on about 38% Alt. 2 and 24% Alt. 3 of the forested landscape. It can be assumed that within treatment areas there would be a reduction in snags and logs due to skid trails, landings, safety reasons and prescribed burning. Proposed activities (tree harvest and prescribed burning) are expected to help create habitat for primary cavity excavators (PCEs) that use open forests (e.g. white-headed woodpeckers) and reduce habitat for those PCEs using dense forests (e.g. pileated woodpeckers).

The potential removal of trees >=21" dbh on up to 5,135 acres in alternative 2 (32% of the commercial harvest area) may likely negatively affect the long-term recruitment of snag habitat, as these trees would no longer be available as potential snags (no trees >= 21" would be cut in alternatives 1 and 3) (Table 7).

Because alternative 3 does not remove trees >=21" dbh and harvest occurs on fewer acres, the loss of current and future snag and down-log habitat is less than in alternative 2 (Tables 6,7,8).

The closing of roads will positively affect the abundance of snag and down wood habitat; therefore alternative 2 will have a less negative impact than Alternative 3 because fewer roads will be open to the public. Bate et al. (2007) and Wisdom and Bate (2008), found that snag numbers were lower adjacent to roads due to removal for safety considerations, removal as firewood, and other management activities (Bate et al. 2007, Wisdom and Bate (2008), Hollenbeck et et al. 2013).

Road closures and decommissioning would reduce disturbance and limit access for firewood cutting and snag loss. Ongoing miles of open roads and an 'open forest' for use by motor vehicles cumulatively limit the amount of snags across the landscape. Alternative 1 reduces open road miles by 52 miles. Alternative 2 reduces the number of miles of open road from existing condition by 69 miles, and Alternative 3 reduces the miles of open road from existing condition by 9 miles

Prescribed fire

Under the two action alternatives up to 90,000 acres of prescribed fire would be available for implementation. The difference in priority class for prescribed fire is the amount of area within harvest treatment units. Because fewer acres are to be harvested (including stand improvement prescriptions) in Alternative 3, fewer acres of High priority prescribed fire has been identified.

Low-intensity prescribed fires can create or destroy snags (Saab et al. 2006, Bagne et al. 2008), and few studies have followed the dynamics of snags or beetle populations following fire applications to determine the length of time beetle populations or standing snag numbers remain high after treatments, or how the delay in decay of newly created snags, which affects suitability for cavity excavation, affects populations of primary and secondary cavity-nesting birds and mammals (Russell et al 2009).

Studies on the effects of prescribed fire on downed wood and forest structure observed increases in snag densities, including large diameter snags (Saab et al., 2006). This study also observed that nearly half of large down-wood (greater than 9 inches LED) was consumed by prescribed fire (Saab et al., 2006). Other studies have shown a decrease in overall snag densities (Horton and Mannan 1988, Machmer 2002, Randall-Parker and Miller 2002, Bagne et al 2007). In the east Cascades of Washington, burning and burning and thinning treatments tended to increase snag density in one study, although they were often small-diameter (e.g., 20–39.9 cm dbh) snags (Hessburg et al 2010). Additionally, other researchers suggests prescribed fires will likely result in loss of snags, particularly in the large (>20") size class (Finch et al. 1997, Pilliod et al. 2006).

Fire severity during the burn operations contributes largely to the expected impacts to snags and down-wood loss and recruitment.

Table 6. Summary of cumulative impacts to dead and defective wood habitat for Alternative 2 (acres and percent of area harvested).

	UF_PVG				
Alternative 2	Dry	MST	Other	Total	% of Forested Area Harvested
Commercial harvest	12,010	3,367	531	15,908	28
Stand improvement	3,418	2,011		5,429	10
Not treated	27,238	7,533		34,771	62
Total Forested area	42,666	12,911	531	56,108	

Table 7. Summary of area that live trees >=21" may be removed in Alternative 2 (forest plan amendment).

Alternative 2	Acres Commercial Harvest	21" = yes	% Harvest Area with trees >=21" potentially removed
Dry PVG	12,010	4,915	41
Moist PVG	3,418	220	6
Total Commercial Harvest	15,428	5,135	33

Table 8. Summary of cumulative impacts to dead and defective wood habitat for Alternative 3 (acres and percent of area harvested).

	UF_PVG				
Alternative 3	Dry	MST	Other	Total	% of Forested Area Harvested
Commercial harvest	7,293	2,717	284	10,294	18
Stand improvement	1,824	1,168		2,992	5
Not treated	33,549	9,026		42,575	76
Total Forested area	42,666	12,911	284	55,861	

Cumulative Effects on Dead and Defective Habitat

The list of past, present and foreseeable actions was reviewed to determine potential effects to dead and defective wood habitat. Other actions which would contribute to potential cumulative effects include hazard tree removal and firewood gathering. Within the Lower Joseph project area (nearly 100,000 acres), there are no other vegetation projects planned in the foreseeable future.

Cumulative effects of the proposed project and the potential for hazard tree removal and firewood gathering have the potential to impact habitat and may increase risks to dead and defective wood habitat. This increased risk to loss of snags is of most concern in the Moist Forest PVG.

Alternative 1 would not contribute to cumulative effects of other management activities in the analysis area. Snag habitat in past treatment units would slowly develop as these stands grow and snags are naturally recruited in the long-term. In the absence of large scale disturbances snag densities would likely reflect densities from un-harvested areas across the analysis area within 100 years and down wood levels would continue to increase. Drought stress in overstocked stands will increase fuel loadings, increasing the likelihood of stand replacement reducing snag habitat in the long term.

The action alternatives proposed activities (removing trees, retaining large trees (Alt 3 only)), and prescribed burning) are expected to help create habitat for PCEs associated with open forests and reduce habitat for those PCEs using closed-canopied forests. Both alternatives would retain snags >12 inches diameter, except those lost for operational reasons or during prescribed burning. Snag losses by prescribed fire are assumed to be very low since burning prescriptions are aimed at retention of large diameter woody materials. This would result in minor effects to overall abundance of snags on the landscape.

Design criteria for the retention of snags and down wood would help maintain existing levels of this habitat for primary cavity excavators, which in turn would provide for secondary cavity nesters. Connectivity corridors with higher stand densities, and skips within units would provide diversity of canopy cover and stand structure at various scales across the landscape as well as maintain some levels of natural snag creation. Alternative 2 proposed harvests (commercial and non-commercial) on about 42% of the moist forest, and 40% of the overall forested acers (Table 6). Alternative 3 proposed harvests (commercial and non-commercial) on about 30% of the moist forest, and 23% of the overall forested acers (Table 8).

Road closures and decommissioning would reduce disturbance and limit access for firewood cutting and snag loss. Open roads provide access to firewood cutters into the areas. Loss of snags to firewood gatherers would contribute in localized areas of snag loss in combination with the loss from harvest operations. Ongoing miles of open roads and an ‘open forest’ for use by motor vehicles cumulatively limit the amount of snags across the landscape. Because Alternative 2 proposes to close the most miles of roads, the future potential for loss of snags due to safety and firewood harvest is reduced the most.

The cumulative effects of the proposed activity in alternatives 2 or 3, , would have a positive effect for some species and a negative effect for others. White-headed woodpecker, which is a species of population viability concern, would benefit from treatments that accelerate the development of open canopied stands that maintain large snags, while habitat for species associated with closed-canopied forests with snags may decline.

Conclusion for Dead and Defective Habitat

It can be assumed that an increase in treatment unit acres would result in a greater reduction in snags and logs due to skid trails, landings, safety and prescribed burning. Alternative 3 treats fewer acres in the Lower Joseph project area compared to Alternative 2. Also the harvest of large trees (>=21” dbh) may adversely affect the future recruitment of large snags. Overall, alternative 3 would better meet the snag needs for PCEs associated with closed canopies, while alternative 2 would benefit species associated with more open canopies. Standards for snags and down wood would be met in both action alternatives

Alternative 1 proposes to implement 53 miles of road closures or decommissions, approved by past projects within the watershed. Alternative 2 proposes to reduce the number of miles of open road from existing condition by 70 miles, and Alternative 3 proposes to reduce the miles of open road from existing condition by 8 miles.

This project impacts less than 2% of forested habitat across the Forest, the overall direct, indirect and cumulative effects would result in a small negative trend of snag/downwood habitat in the short term. Mitigation measures are in place to protect large snags during both harvesting and prescribed burning activities. The changes in habitat would be insignificant at the scale of the Forest. The Lower Joseph Project is consistent with the Forest Plan, and thus continued viability of MIS for dead and defective wood habitat is expected on the Wallowa-Whitman National Forest in both action alternatives.

Pileated Woodpecker

The Pileated woodpecker is an MIS for both dead and defective wood habitat and old growth habitats. Below is a summary of Pileated woodpecker ecology important to providing information pertinent to assessing impact of the project on the species. For additional details see the body of work by Evelyn Bull in the Blue Mountains (Bull 1987, Bull and Holthausen 1993, Bull et al. 2005, Bull et al. 2007), Nielsen-Pincus and Garton (2007), and Mellen-McLean (2012).

Pileated woodpeckers are associated with late-seral stages of the subalpine, montane, lower montane forests. Specifically, the old-forest single- and multi-strata stages of mixed conifer forests (Wisdom et al. 2000). Stands of pure ponderosa pine typically lack the abundance of snags and downed wood necessary for foraging habitat for pileated woodpeckers (Bull et al. 2007). In the Blue Mountains, densities of nesting pairs of pileated woodpeckers were positively associated with the amount of late structural stage forest and negatively associated with the amount of area dominated by ponderosa pine and the amount of area with regeneration harvests since 1970 (Bull et al. 2007).

Snags, down logs, and large hollow trees are important habitat components for Pileated woodpeckers. Large ponderosa pine and western larch snags are used for nesting and roosting (Bull 1987). Bull and Holthausen (1993) found that density of large snags (> 20 inches dbh) was the best predictor of density of pileated woodpeckers in the Blue Mountains. The woodpeckers also use large, decadent trees and hollow grand fir for roosting (Bull et al. 1992). Large snags and down logs are important foraging substrate for pileated woodpeckers in the Blue Mountains (Bull 1987).

Pileated woodpeckers are considered vulnerable in the state by Oregon Department of Fish and Wildlife (http://www.dfw.state.or.us/wildlife/diversity/species/docs/SSL_by_taxon.pdf). However, they are considered "apparently secure" in Oregon by NatureServe (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Dryocopus+pileatus).

Existing Conditions for Pileated Woodpecker

Due to an increase in dense, multi-canopy stands due to fire suppression, habitat for Pileated woodpeckers is increasing across the Blue Mountains (Wisdom et al. 2000). However, densities of large-diameter snags (>21 inches dbh) have declined from historical to current levels (Wisdom et al. 2000, Korol et al. 2002).

As discussed in the Dead and Defective Habitat section above, densities of large snags (>20 inches dbh) in the EMC WHT are below reference conditions in the snag density classes that provide habitat for pileated woodpeckers (Figures 2 and 3)] Snag habitat is likely to be a limiting factor for pileated woodpeckers in the EMC habitat types (moist forest pvg).

A viability assessment completed for the LRMP Revision indicates a moderate viability concern for the Pileated woodpecker on the Wallowa-Whitman National Forest; suitable environments are moderately distributed and/or exist at moderate abundance across the historical range of the species (Wales et al. 2011).

Stands of pure ponderosa pine typically lack the abundance of snags and downed wood necessary for foraging habitat for pileated woodpeckers (Bull et al. 2007). In the Blue Mountains, densities of nesting pairs of pileated woodpeckers were positively associated with the amount of late structural stage forest and negatively associated with the amount of area dominated by ponderosa pine and the amount of area with regeneration harvests since 1970 (Bull et al. 2007).

Although there is a preference for closed canopy stands, high tree mortality and loss of canopy closure in stands of grand fir and Douglas fir did not appear to be detrimental to pileated woodpecker provided that large dead or live trees and logs were abundant and that stands were not subject to extensive harvest. Pileated woodpecker densities remained steady over 30 years in areas where canopy cover dropped below 60% due to tree mortality; older stands of grand fir and Douglas fir consisting primarily of snags continued to function as nesting, roosting and foraging habitat for pileated woodpeckers. While closed canopy forests were not essential for use by pileated woodpeckers, nest success was higher in home ranges that had greater amounts of forested habitat with ≥ 60% canopy closure (Bull et al. 2007).

The quantity of open roads across negatively influences the abundance of large snag due to removal for safety considerations, removal as firewood, and other management activities (Bate et al. 2007, Wisdom and Bate (2008), Hollenbeck et al. 2013).

Due to an increase in dense, multi-canopy stands due to past management including fire suppression, structural conditions used by Pileated woodpeckers may have increased especially in drier potential vegetation types. On the Wallowa-Whitman NF, Wales et al (2011) found that RV for pileated woodpeckers in potential habitat was 1-39 % at the watershed scale. Currently in the LJ project area pileated woodpecker is at about 16% of the RV.

Potential habitat for this species was defined as a subset of the ‘Dry PVG’, and also all of the Moist PVG. The subset of the ‘Dry PVG included Dry Grand-Fir and Dry Douglas Fir. Additionally source habitat for this analysis was defined as large trees (>=21”), with a canopy closure of >=40% in the Dry types and >=60% in the Moist types.

Effects to Pileated Woodpecker

Mitigation measures (all Alternatives) – In addition to protection measures listed for Dead Wood and Snags (see MIS cavity excavator – above)

Pileated Woodpecker

Wild – 26

To conserve nesting habitat of raptors or pileated woodpecker, consult the wildlife biologist to establish a nest zone buffer around any new, or existing, nests discovered prior to or during project layout and implementation and, if appropriate, to restrict activities within the nest area during occupancy, according to requirements of the species involved.

Wild – 27

Protect known (and active) pileated woodpecker nests during all harvest or prescribed burning activities. Maintain a no-cut buffer within 50 feet. Protect nest tree through the use protection measures such as raking and lighting techniques during prescribed burning.

Trees

Wild – 1

No harvest of trees >=21” dbh within MA15s, Goshawk PFA’s (map provided and or newly found sites), moist forest, large tree (>=20” dbh), closed-canopied (>60%) forests (marten habitat).

Wild – 2

Trees with stem damage, heavy stem decay, poor form, broken tops, numerous large branches, or other characteristics that make them unsuitable for commercial products would be retained for wildlife habitat when available, in the longer term, these trees may become quality snag habitat. Consider skips, or the design of ‘clumps’ in thinning units to avoid thinning in vicinity of these unique trees

Wild - 3

No harvest of trees >=21” dbh (Alternative 3).

Wild - 4

Retain designated leave trees damaged during logging operations in harvest areas, unless determined to be a safety hazard.

Effects assume project design criteria Wild-1-14 , and Wild-26-27 (Appendix J) would be implemented. These mitigation measures include protection measures for large trees, large snags, down-logs during harvest and burning activities. Snags >=12” are only to be removed due to safety considerations. Harvest of large trees is allowed only in Alternative 2 and on approximately 5,100 acres, excluding areas within MA15s, PFA’s, and cool-moist large tree – closed canopied forests. Wild-29, -30, -31 describe conservation measures to protect pileated woodpecker nests.

Alternative 1:

Quantity of source habitat will not change. Source habitat abundance will remain within the RV. No harvesting occurs within source habitat leaving habitat quality unchanged due to harvest activities.

The abundance of open roads across the planning area would be reduced from existing conditions in Alternative 1. Removal of snags for fire-wood and safety would be reduced as effective road closures are implemented across the planning area. Approximately 52 miles of roads that are currently open would be closed in Alternative 1, potentially leading to an increase in habitat quality through snag retention along roads and decreased human disturbance.

Ongoing tree growth would continue to increase canopy closure and density of large trees and snags, thus increasing source habitat for pileated woodpeckers and goshawks. Risk to loss of live trees due to insects and/or disease would continue to increase which may increase snag habitat, though also depending the scale of the disturbance may change the suitability of existing habitat due to loss of live trees. Risk to large scale fire would continue to increase, large-scale stand replacing fires would reduce source habitat for pileated woodpecker..

Risk to loss of live trees due to insects and/or disease would continue to increase which may increase snag habitat, though also depending the scale of the disturbance may change the suitability of existing habitat due to loss of live trees. Bull et al. (2007) found that high tree mortality and loss of canopy closure in stands of grand fir and Douglas fir did not appear to be detrimental to pileated woodpecker provided that large dead or live trees and logs were abundant and that stands were not subject to extensive harvest.

As no change to pileated woodpecker will occur from management activities, and there is a reduction in open roads from existing condition, habitats will remain viable at the forest and at the project scale.

Alternative 2

Quantity of source habitat will decrease slightly (about 400 acres) from Alternative 2. Due to the resulting increase in mean diameter of stands that have been harvested and retention of some areas with canopy closure remaining above 40%, some areas harvested will remain or become by definition source habitat. Canopy closure remains above the minimum (40% in the Dry PVGs, and 60% in the Moist PVGs, and mean diameter of the trees is >=21”, the area should qualify as source habitat based on tree size and average canopy closure. Source habitat abundance will remain within the HRV (15 %) (see table 9).

Quality of habitat and potential future habitat will decline through the loss of canopy closure, loss of large trees (>=21”) (5,135 acres), and loss of incidental large snags. Although snags are not prescribed to be removed, snag densities will decline due to safety, skid trails, and landings. Alternative 2 proposes the greatest number of acres of harvest (21,337 acres), thus the loss of large snags, and loss of canopy will be the greatest in this alternative.

Under alternative 2, the abundance of open roads across the planning area would be reduced by 69 miles compared to the existing conditions. As compared to alternatives 1 and 3, this reduction in the amount of open roads would have the greatest positive impact of any of the alternatives

Risk to large scale fire would be reduced (see fire write-up). Large-scale stand replacing fires would not provide source habitat for pileated woodpecker.

Of the 3928 acres of source habitat retained in Alternative 2 about 2661 are in the ‘high’ priority for prescribed fire (Dry PVG). Implementation of thinning or prescribed burning is likely to result in loss of snags, future snags, and down wood that are important habitat attributes of pileated woodpecker. The retention and protection of snags (see mitigation measures) during treatments should minimize the effects of treatments on cavity dependent wildlife, and retaining some down wood in treated stands should minimize negative effects on species that depend on this habitat structure such as the pileated woodpecker (Pilliod et al. 2012).

Finch and others (1997) reviewed studies that evaluated the effects of prescribed fire on snags and down wood in southwestern ponderosa pine forests and found that snag loss was greatest in the large size classes and in the decay classes that contained nest cavities. Snag loss typically ranged from 20- 80 percent and loss of down wood from 42-74 percent depending on the burn severity and dead wood characteristics (Finch et al 1997, Randall-Parker and Miller 2002).

Additional negative effects would include short-term disturbance during nesting and breeding season. Design criteria for retention of large wood or snags within clumps, burning fuels as soon as possible after they cure, and protecting large snags, down logs and trees during prescribed fire would offset some of the negative effects to pileated woodpeckers and their habitat.

<u>Alternative 3</u>

Quantity of source habitat declines the most in Alternative 3; however source habitat abundance will remain within the RV. Although the overall area with harvesting in Alternative 3 is less than in Alternative 2, the resulting amount of source habitat for pileated woodpeckers, appears to be lower. In Alternative 3 more acres of vegetation that is currently in the size class of medium (15-20"), and post-harvest the quadratic mean diameter of the stand actually increases and moves the stand in to the next size class (>20" dbh), while also maintaining >40% canopy closure.

Quality of habitat for pileated woodpeckers will decline through the loss of canopy closure, and loss of large snags. Although snags are not prescribed to be removed, snag densities will decline due to safety, skid trails, and landings. Alternative 3 proposes fewer acres than alternative 2 of overall harvest (12,220) thus the loss of large snags will be less in this alternative. Additionally, Alternative 3 does not include removal of trees >21" dbh which will help to maintain higher quality of habitat on those areas treated that retain sufficient size class and tree canopy to remain source habitat.

The abundance of open roads across the planning area will be reduced by 8 miles. As compared to Alternatives 1 and 3, this reduction in the amount of open roads will have the least impact of any of the alternatives, and minimal change from the existing condition. The potential for removal of snags for fire-wood and safety will be reduced across the planning area on approximately 8 miles.

Risk to large scale fire would be reduced (see fire write-up). Large-scale stand replacing fires would not provide source habitat for pileated woodpecker.

Risk to loss of live trees due to insects and/or disease would be reduced across the planning area (see silviculture write-up). Although, Bull et al. (2007) found that high tree mortality and loss of canopy closure in stands of grand fir and Douglas fir did not appear to be detrimental to pileated woodpecker provided that large dead or live trees and logs were abundant and that stands were not subject to extensive harvest.

Because fewer acres are to be harvested (including stand improvement prescriptions) in Alternative 3, fewer acres of High priority prescribed fire has been identified. In the east Cascades of Washington, burning and burning and thinning treatments tended to increase snag density in one study, although they were often small-diameter (e.g., 20–39.9 cm dbh) snags (Hessburg et al 2010). Additionally, other researchers suggests prescribed fires will likely result in loss of snags, particularly in the large (>20") size class (Finch et al. 1997, Pilliod et al. 2006). Fire severity during the burn operations contributes largely to the expected impacts to snags and downwood loss and recruitment.

Though some current source habitat would be harvested, and the quality of the habitat may be reduced, overall, source habitat would remain within the RV for this species in this project area. Therefore, the LJCRP would not contribute to a negative trend in viability on the WWNF for the pileated woodpecker.

Table 9. Source habitat for Pileated Woodpeckers by alternative

Pileated Woodpecker	Alternative 1	Alternative 2	Alternative 3	Comment
Source Habitat (acres)	7,449	7,034	6,615	
% HRV	16%	15%	14%	The current condition as well as the outcome of all alternatives, maintain source habitat within the HRV. The HRV for this species is about 1-39%.
Acres source habitat with harvest	0	1,896	1,063	Acres of pileated woodpecker habitat that has been harvested are likely lower quality.
% source habitat with harvest	0	27%	16%	Acres of pileated woodpecker habitat that has been harvested are likely lower quality. It is expected that within 10-30 years the habitats that were harvested and are of lesser quality will transition to higher quality source habitat
Acres of source habitat not commercially treated	7,449	5,138	5,552	Pileated woodpecker habitat that is not harvested, are likely higher quality habitat.
% HRV of source habitat not treated	16%	11%	12%	Untreated pileated woodpecker habitat is within the HRV (1-39%). It is expected that within 10-30 years the habitats that were harvested and are of lesser quality will transition to higher quality source habitat.
Acres of large (>=21" trees) potentially harvested	0	739	0	Loss of large trees will negatively affect the quantity and quality of current and future habitat for pileated woodpeckers.
Miles of road closed and/or decommissioned (from Existing Condition)	53	70	8	The greater the reduction in open roads, the greater the benefit to pileated woodpeckers. Removal of snags an important habitat feature is greater along open roads.

The loss of Large (>21") trees in Alternative 2 (only) will negatively affect Pileated Woodpeckers and other cavity nesting and large tree dependent wildlife species.

Table 7. Summary of area that live trees >=21" may be removed in Alternative 2 (forest plan amendment).

Alternative 2	Acres Commercial Harvest	21" = yes	% Harvest Area with trees >=21" potentially removed
Dry PVG	12,010	4,915	41

Moist PVG	3,418	220	6
Total Commercial Harvest	15,428	5,135	33

Conclusions for Pileated Woodpecker

Within the Blue Mountains Ecological Reporting Units, Wisdom et al. (2000) found that source habitat for pileated woodpeckers has increased since historical. Although source habitat for pileated woodpeckers is well within the HRV for this project area, and projected to remain within the HRV following any proposed treatment (alternative 2 or 3), a viability and habitat assessment completed for the LRMP Revision indicates that across the Wallowa-Whitman NF, source habitat in most watersheds is below the HRV (Wales et al. 2011). The viability analysis completed with this more recent habitat evaluation determined a moderate viability concern for the Pileated woodpecker on the Wallowa-Whitman National Forest; suitable environments are moderately distributed and/or exist at moderate abundance across the historical range of the species (Wales et al. 2011).

At the scale of the project area the abundance of source habitat is projected to remain within the HRV following any of the Alternatives proposed in this project. At the scale of the Forest the abundance of source habitat is not expected to change significantly (Table 9), and the pileated woodpecker is expected to remain viable.

Though some current source habitat will be harvested, and the quality of the habitat may be reduced, overall, source habitat will remain within the Range of Variation for this species in this project area. Protection measures are in place to conserve large trees, large snags and down-logs during harvest and prescribed fire activities. In the longer term (>=20 years) habitat quality and quantity will continue to increase as the trees grow, canopy closure increases, and snags are created from normal disturbance processes, Therefore, the Lower Joseph Project will not contribute to a negative trend in viability on the Wallowa-Whitman National Forest for the Pileated woodpecker.

Though habitat abundance will decline, and the quality of the habitat may be reduced, alternative 3 would not likely contribute to a negative trend in viability on the WWNF for the pileated woodpecker due to the overall abundance of habitat on the forest. Wales et al. 2007 did a viability analysis for this species currently and into the future, determining that at the landscape scale, even with expected levels of management, viability for this species is not a concern either now nor into the future.

Table [9]. Summary of impacts to Pileated woodpecker habitat by Alternative (acres of source habitat)

	Existing	Alternative 2	Alternative 3
Project Area (% HRV)	7,449 (16%)	7,034 (15%)	6,615 (14%)
Wallowa-Whitman National Forest*	**206,175 (14%)**	199,140 (13%)	199,560 (13%)

Cumulative Effects to Pileated Woodpecker and Northern Goshawk, MIS species and other older forest associated wildlife

The cumulative effects analysis area for these MIS (Pileated Woodpecker, Northern Goshawk) is summarized together as these species use overlapping habitats. These species are generally associated with structurally diverse, closed –canopied forests with larger tree structures. Additionally Pileated woodpeckers use primarily large snags for nesting, foraging and roosting and both the pileated woodpecker are associated with down woody debris. Past timber harvesting, firewood gathering and an extensive road system have likely reduced some of these habitat components (e.g. large snags) within some areas in the project area. Additionally fire suppression has likely changed the abundance of these habitats, as would the likely continued use of fire suppression in the foreseeable future. Fire suppression particularly in the dry forests has led to an increase, above RV of source habitat for both these species. Past vegetation management projects have been incorporated into the existing condition to evaluate the current abundance of these structural conditions for these species.

The action alternatives proposed activities (removing trees, retaining large trees (Alt 3 only) , prescribed burning) are expected to reduce the amount of closed canopied forests and the quality of habitat would decline through the loss of canopy closure, loss of large trees (>=21") (Alt, 2 only), and loss of large snags from operational procedures. Although some of these important habitat components would be reduced, they would not be eliminated. This may reduce the potential of the area to provide habitat for goshawks and pileated woodpeckers in the short term (0-20 years) however, the quantity of source habitat for these species is projected to increase and remain within the HRV in the longer term (>=50 years) (see Appendix C).

Both alternatives would retain snags >12 inches diameter, except those lost for operational reasons or during prescribed burning. Potential loss of snags for operational reasons would result in a minor effect since the existing snag component (see cumulative effects for Primary Cavity Excavator MIS for more information on effects to snags/logs). The harvest of trees >=21" (alternative 2) would have a negative cumulative effect on longer-term goshawk and pileated woodpecker habitat as this is an important habitat component especially for pileated woodpeckers as it potentially transforms to a snag. Large live trees provide an important nesting habitat component for goshawks.

Current wood cutting policies and lack of law enforcement may be detriment to future snag habitat in the Lower Joseph project area especially for pileated woodpeckers. Because Alternative 2 proposes to close the most miles of roads, the future potential for loss of snags due to safety and firewood harvest is reduced the most in this alternative

Continued fires suppression may increase fuel loadings, increasing the likelihood of stand replacement disturbance events. In the action alternatives the risk to large scale fire would be reduced (see fire write-up). Large-scale stand replacing fires would not provide source habitat for northern goshawk or pileated woodpecker. However, the amount of post-fire habitat in the planning area is below RV, and some wildlife species are associated with post-fire habitat (e.g. black-backed woodpecker).

This project will impact pileated woodpecker and goshawk habitat in the project area. Though some current source habitat will be harvested, and the quality of the habitat may be reduced, overall, source habitat will remain well within the Range of Variation for these species in this project area (Table 65, 66), and at the scale of the Forest (Table 9, Table 10). The HRV for the Forest for pileated woodpeckers is 1-39% and the HRV for northern goshawks is 1-46% (Wales et al. 2011). Primarily as a result of an abundance of source habitat in many areas above the median HRV, the viability of goshawks in the Blue Mountains was calculated to currently be an A outcome (low concern) (Wales et al. 2011). Low concern for viability is defined as: current habitats are of moderate or higher abundance and quality relative to historical conditions, and are widely distributed or if gaps in distribution are present they are similar to historical distribution of habitat. A viability assessment completed for the LRMP Revision indicates a moderate viability concern for the Pileated woodpecker on the Wallowa-Whitman National Forest; suitable environments are moderately distributed and/or exist at moderate abundance across the historical range of the species (Wales et al. 2011).

Table [9]. Summary of impacts to Pileated woodpecker habitat by Alternative (acres of source habitat)

	Existing	Alternative 2	Alternative 3
Project Area (% HRV)	7,449 (16%)	7,034 (15%)	6,615 (14%)
Wallowa-Whitman National Forest*	206,175 (14%)	199,140 (13%)	199,560 (13%)

* acres calculated by Wales et. al. (2011)

Table [10]. Summary of impacts to Northern Goshawk habitat (acres) by Alternative

	Existing	Alternative 2	Alternative 3
Project Area – source habitat (% of HRV)	19,000 (34%)	14,990 (27%)	15,800 (29%)
Wallowa-Whitman National Forest – source habitat*	440,300 (27%)	425,400 (27%)	437,200 (27%)

* acres calculated by Wales et. al. (2011)

Northern Goshawk

The goshawk is a MIS with nesting requirements associated with old-growth habitat, but will use a variety of forest structure types for other life history needs. It is an indicator of the abundance and distribution of mature and old-growth forests.

The northern goshawk uses a complex mosaic of landscape conditions to meet various life history requirements for nesting, post-fledgling, and foraging (Reynolds et al. 1992). Goshawk nesting habitat in eastern Washington and Oregon was generally composed of mature and older forests (McGrath et al. 2003). Nest stands were typically composed of a relatively high number of large trees, high canopy closure (>50%), multiple canopy layers, and a relatively high number of snags and downed wood (Finn 1994, McGrath et al. 2003).

Goshawks forage in a variety of forest types; however several studies have shown the importance of mid to late successional forests as foraging habitat for goshawks (Austin 1993, Bright-Smith and Mannan 1994, Hargis et al. 1994, Beier and Drennen 1997, Patla 1997, Daw and DeStefano 2001, Finn et al. 2002 a, b, Drennan and Beier 2003, Desimone and DeStefano 2005). Results from Beier and Drennen (1997) supported the hypothesis that goshawk morphology and behavior are adapted for hunting in moderately dense, mature forests, and that prey availability (as determined by the occurrence of favorable vegetation structure) is more important than prey density in habitat selection. Salafsky and Reynolds (2005) showed that goshawk productivity was related to prey availability, especially critical prey species. Taken together, these studies show the importance of habitat structure to goshawk foraging behavior and productivity.

Changes in forest structure due to fire exclusion within the dry forest cover types may seem to increase the availability of source habitat for the goshawk. However, they may not be as valuable as the more open habitats they replaced because the in-growth of small trees may obstruct flight during foraging, suppress growth of large trees needed for nesting, and reduce the growth of herbaceous understory that provides habitat for prey (Reynolds et al. 1992).

Human disturbances at goshawk nest sites have been suspected as a cause of nest abandonment (Reynolds et al. 1992). In addition, roads and trails may facilitate access for falconers to remove young from nests (Erdman et al. 1998). Wisdom et al. (2000) identified habitat fragmentation or habitat loss as a forest road-associated factor for goshawks. In addition, roads may increase the likelihood of the removal of snags for safety and firewood collection, which could have negative effects on the prey base for goshawks (Wisdom et al. 2000). However, Grubb et al. (1998) reported that vehicle traffic with a noise level of <54 decibels on roads >400m from nest sites did not result in discernable behavioral response by goshawks in forested habitats.

Existing Conditions for Northern Goshawk

Wales et al. (2011) analyzed source habitat of numerous wildlife species of interest in the Blue Mountains and WWNF in support of the Blue Mountains Forest Plan Revision. Source habitats are defined by Wales as those stands that provide for a stable or increasing population and for all the life history needs of the goshawk including nesting, roosting, foraging, resting, travel, and dispersal. Potential habitat is defined as stands within dry Douglas-fir, dry grand fir, cool moist and cold dry potential vegetation groups that have the capability to provide source habitat but that currently do not provide the tree size, canopy cover, or structural conditions.

Wales et al. (2011) estimated that approximately 466,679 hectares of source habitat existing on the WWNF historically. Currently, approximately 440,696 acres (94% of estimated historical conditions) of source habitat occurs on the WWNF.

Source habitat for the goshawk is identified as forests with >15” DBH and closed canopies (dry forests canopy closure >=40%, moist forest canopy closure >=60%). The risk and habitat quality factors were the abundance of forests with trees >20” and closed canopy as well as habitat effectiveness. Primarily as a result of an abundance of source habitat in many areas above the median HRV, the viability of goshawks in the Blue Mountains was calculated to currently be an A outcome (low concern) (Wales et al. 2011). Low concern for viability – Current habitats are of moderate or higher abundance and quality relative to historical conditions, and are widely distributed or if gaps in distribution are present they are similar to historical distribution of habitat.

The existing condition within the Lower Joseph watershed contains 18,936 acres of source habitat for the Northern Goshawk. This corresponds to about 34% of the potential habitat. The RV for this species that was calculated as a mean across all watersheds on the Wallowa-Whitman NF (Forest Plan Revision, Wales et al. 2012) found the range to be 1-46%. Currently goshawk habitat is above the HRV in the Lower Joseph project area.

During the summer of 2014, Northern Goshawk surveys were completed across the planning areas. Historical nest locations, MA 15s, and areas with large tree structures were prioritized. Priority areas were generally surveyed twice between June and July. Six goshawk nesting areas were located. In order to meet Regional Forester’s Eastside Forest Plans Amendment #2, Goshawk Standards, the following measures would be applied to each of the 6 nesting areas as well as additional nesting areas located during implementation: 1) Commercial harvest will not occur in the 6 identified known nest areas (approximately 30 acres (minimum); 2) No harvest of LOS habitat within an identified 400 acre post-fledgling area. The desired conditions within the approximately 400 acre (minimum) PFAs is to provide areas with larger trees, higher canopy, multiple canopy layers, large logs, and large snags to provide suitable habitat including foraging substrates for post breeding goshawks (Reynolds et al 1992, Daw and DeStephano (2001). Post-fledgling areas may also provide alternate nesting areas (Reynolds et al. 1992).

Effects to Northern Goshawk

Mitigation Measures:

Goshawk

In order to meet Regional Forester’s Eastside Forest Plans Amendment #2, Goshawk Standards, the following measures would be applied:

Wild – 15

Protect known active and historically used (known nesting activity occurring at the site within the last five years) goshawk nest site from disturbance. Defer harvest from 30 acres of the most suitable nesting habitat surrounding all active and historical nest trees.

Wild – 16

Within the 6 mapped goshawk PFAs, no harvest in stands that are currently providing LOS source habitat for goshawks (>=20”dbh and canopy closure >=50% in the dry and >=60% in the moist).

Wild – 17

If a new goshawk nest site is located during monitoring (see Goshawk Monitoring) or sale preparation, the site would be protected by eliminating harvest on 30 acres of the most suitable nesting habitat around the nest site. A 400 acre post fledging area would be designated around the core nest area (if not already designated). Proposed harvest activities that move young stands toward a late old structure condition could occur. Late and Old (LOS) stands would be retained per Regional Foresters Amendment #2 (Senario A). Activities in the post fledging area would apply recommended guidelines for structural composition as described in Reynolds et al. 1992.

Wild – 18

No harvesting of trees >=21” dbh within PFAs, unless a safety hazard. If trees of snags felled for safety purposes, retain them on site for down wood.

Wild – 19

Restrict project activities within ½ mile* of an active goshawk nests between April 1 to August 31 to avoid possible disturbance of goshawk pairs while bonding and nesting. Prohibited management activities include all Forest Service and contracted activities, including but not limited to, such activities as timber harvest, non-commercial thinning, prescribed fire, and roadwork.

*In site-specific cases, the ½ mile distance may be reduced to ¼ mile along frequently traveled roads that would be used for haul routes, where the birds are habituated to traffic, or where topography and vegetation provide a buffer for noise disturbance. Consult District wildlife biologist for direction. Burning operations, non-commercial thinning operations in vicinity of post-fledgling area would generally require the ½ mile buffer.

Wild – 20

In the areas that are not providing LOS source habitat within the PFAs the intent is to enhance stands toward LOS habitat: the objective is to move young stands toward a late old structure. To the extent possible, retain multi-story characteristics, vegetation complexity, large snags, and large down logs. Consider designing unthinned patches (skips) near riparian, springs or seeps, as these can be favored by goshawks for nesting

Wild – 21

Closed roads within goshawk territories that have grown in with thickets would be maintained in an undriveable state. Non-commercial thinning crews would leave sufficient clusters of trees along these roadbeds to prevent any vehicle access.

Wild – 22

Protect trees and snags >=20” during prescribed fire operations using a number of methods including but not limited to raking, pull back, and altering ignition patterns to minimize loss of these structures within PFA.

Wild – 23

A map including the nest areas, post-fledgling areas, and ½ mile restricted disturbance area (April 1-September 30) will be provided to the purchaser.

Effects assume project design criteria Wild-1-14 , and Wild-15-23 (Appendix 1) would be implemented. These mitigation measures provide protection measure for Goshawk PFA’s and large trees, large snags, down-logs during harvest and burning activities.

Alternative 1 –

Quantity of source habitat will not change. Source habitat abundance will remain within the RV. No harvesting occurs within source habitat leaving habitat quality unchanged due to harvest activities.

Ongoing tree growth will continue to increase canopy closure and density of large trees and snags, thus increasing source habitat for goshawks. Risk to large scale fire would continue to increase, large-scale stand replacing fires would not provide source habitat for goshawks.

The abundance of open roads across the planning area would be reduced from existing conditions in Alternative 1. Removal of snags for fire-wood and safety would be reduced as effective road closures are implemented across the planning area. Approximately 53 miles of roads that are currently open would be closed in Alternative 1, potentially leading to an increase in habitat quality through snag retention along roads and decreased human disturbance.

As no change to goshawk habitat will occur from management activities, and there is a reduction in open roads from existing condition, habitats will remain viable at the Forest and at the project scale.

Alternative 2 – Through harvest, the abundance of source habitat for goshawks is reduced by about 4000 acres (Table 11). The amount of source habitat remains with the HRV at about 27% (1-46%). After harvest, approximately 20% (3,800 acres) of the source habitat will have had harvest occur yet meet the definition of source habitat (canopy closure >=40% (dry pvg) or >60% (moist pvg) and overall tree size of >=25" dbh). On approximately 2,300 acres trees >=21" dbh may have been harvested. Source habitat that has been harvested will likely be of lower quality due to the loss of canopy closure, loss of large trees, and loss of large snags and logs due to safety and logging systems.

Although trees with mistletoe are likely to be removed in all harvest units, especially in the prescriptions 'Intermediate Treatments' (180 acres), the loss of mistletoe may also reduce the quality of source habitat. The removal of trees with dwarf mistletoe brooms may be detrimental to northern goshawk and other species that nest in mistletoe brooms (Bull and others 1997).

The closure/decommissioning of an additional 17 miles above that proposed in Alternative 1 should benefit Northern Goshawks, as human disturbance has been documented to negatively affect this species. As compared to Alt. 1 and Alt. 2, Alternative 2 would reduce the potential for human disturbance the most due to closing or decommissioning the most miles of open roads.

This project will impact goshawk habitat in the project area. Though some current source habitat will be harvested, and the quality of the habitat may be reduced, overall, source habitat will remain within the Range of Variation for this species in this project area. Protection measures are in place to conserve PFAs, large trees, large snags and down-logs during harvest and prescribed fire activities. Therefore, the Lower Joseph Project will not contribute to a negative trend in viability on the Wallowa-Whitman National Forest for the Northern goshawks.

Alternative 3 - Through harvest, the abundance of source habitat for goshawks is reduced by about 3,100 acres (Table 11). The amount of source habitat remains with the HRV at about 29% (1-46%). After harvest, approximately 11% (2,100 acres) of the source habitat will have had harvest occur yet meet the definition of source habitat (canopy closure >=40% (dry pvg) or >60% (moist pvg) and overall tree size of >=25" dbh). In alternative 3, no trees >=21" dbh may be harvested which will provide for higher quality habitat within the treated areas, as large trees are an important habitat component for goshawks. Source habitat that has been harvested will likely me of lower quality due to the loss of canopy closure, and loss of large snags and logs due to safety and logging systems.

Although trees with mistletoe are likely to be removed in all harvest units, especially in the prescriptions 'Intermediate Treatments' (70 acres within source habitat), the loss of mistletoe may also reduce the quality of source habitat. The removal of trees with dwarf mistletoe brooms may be detrimental to northern goshawk and other species that nest in mistletoe brooms (Bull and others 1997).

As compared to Alt. 1 or Alt. 2, this alternative proposed the fewest road closures from the existing condition. A total of about 8 miles of road are proposed to be closed or decommissioned, offering the least benefit to Goshawks, as human disturbance has been documented to negatively affect this species.

The amount of source habitat remains with the RV (1-46% of potential)

This project will impact goshawk habitat in the project area. Though some current source habitat will be harvested, and the quality of the habitat may be reduced, overall, source habitat will remain within the Range of Variation for this species in this project area. Protection measures are in place to conserve PFAs, large trees, large snags and down-logs during harvest and prescribed fire activities. Therefore, the Lower Joseph Project will not contribute to a negative trend in viability on the Wallowa-Whitman National Forest for the Northern goshawks.

Table 11 - Source habitat for Northern Goshawk by alternative

Northern Goshawk	Alternative 1	Alternative 2	Alternative 3	Comment
Source Habitat (acres)	18,936	14,933	15,831	
% HRV	34	27	29	The current condition as well as the outcome of all alternatives, maintain source habitat within the HRV (1-46%)
Acres source habitat with commercial harvest	-	3,778	2,145	Acres of Northern goshawk habitat that has been harvested are likely lower quality.
% source habitat with commercial treatment	-	20	11	Northern goshawk habitat that has been harvested, are likely lower quality.
Acres of source habitat without commercial treatment	18,936	11,155	13,686	Northern goshawk habitat that has not been harvested, are likely higher quality habitat.
% HRV of source habitat not treated	34	20	25	Northern goshawk habitat that has not been treated is within the HRV. It is expected that within 10-30 years the habitats that were treated and are of lesser quality will transition to higher quality source habitat.
Acres of source habitat with potential for trees >=21" dbh removed	-	2,316	-	Large trees provide an important habitat component for goshawks.

Conclusions for Northern Goshawk

All alternatives maintain the abundance of source habitat within the RV. Though commercial harvest occurs within source habitat in both alternatives 2 and 3, the abundance of source habitat not treated remains within the RV. Much of the harvested areas retains canopy closure at >=40%, and though habitat quality may be reduced, the area likely will provide habitat, and with time the canopy closure and tree size will will increase. Within the 6 known goshawk nesting areas, design elements would maintain overall stand structure within the 400 acre PFAs, with the desired condition to provide areas with larger trees, higher canopy, multiple canopy layers, large logs, and large snags.

Table [10]. Summary of impacts to Northern Goshawk habitat (acres) by Alternative

	Existing	Alternative 2	Alternative 3
Project Area – source habitat (% of HRV)	19,000 (34%)	14,990 (27%)	15,800 (29%)
Wallowa-Whitman National Forest –	**440,300 (27%)**	425,400 (27%)	437,200 (27%)

source habitat*			

* acres calculated by Wales et. al. (2011)

This project will impact goshawk habitat in the project area. Though some current source habitat will be harvested, and the quality of the habitat may be reduced, overall, source habitat will remain within the Range of Variation for this species in this project area. Protection measures are in place to conserve PFAs, large trees, large snags and down-logs during harvest and prescribed fire activities. In the longer term (>=20 years) habitat quality and quantity will continue to increase as the trees grow, canopy closure increases, and snags are created from normal disturbance processes, Therefore, the Lower Joseph Project will not contribute to a negative trend in viability on the Wallowa-Whitman National Forest for the Northern goshawks.

Cumulative Effects to Pileated Woodpecker and Northern Goshawk, MIS species

The cumulative effects analysis area for these MIS (Pileated Woodpecker, Northern Goshawk) are summarized together as these species use overlapping habitats. These species are generally associated with structurally diverse, closed –canopied forests with larger tree structures. Additionally Pileated woodpeckers use primarily large snags for nesting, foraging and roosting and both the pileated woodpecker are associated with down woody debris. Past timber harvesting, firewood gathering and an extensive road system have likely reduced some of these habitat components (e.g. large snags) within some areas in the project area. Additionally fire suppression has likely changed the abundance of these habitats, as will the likely continued use of fire suppression in the foreseeable future. Fire suppression particularly in the dry forests has led to an increase, above RV of source habitat for both these species.
Past vegetation management projects have been incorporated into the existing condition to evaluate the current abundance of these structural conditions for these species.

The action alternatives proposed activities (removing trees, retaining large trees (Alt 3 only) , prescribed burning) are expected to reduce the amount of closed canopied forests and the quality of habitat will decline through the loss of canopy closure, loss of large trees (>=21”) (Alt, 2 only), and loss of large snags from operational procedures. Although some of these important habitat components will be reduced, they will not be eliminated. This may reduce the potential of the area to provide habitat for goshawks and pileated woodpeckers in the short term (0-20 years) however, the quantity of source habitat for these species is projected to increase and remain within the HRV in the longer term (>=50 years) (see Hemstrom’s vegetation modeling results) (is this Appendix?).

Both alternatives would retain snags >12 inches diameter, except those lost for operational reasons or during prescribed burning. Potential loss of snags for operational reasons would result in a minor effect since the existing snag component (see cumulative effects for Primary Cavity Excavator MIS for more information on effects to snags/logs). The harvest of trees >=21” (alternative 2) will have a negative cumulative effect on longer-term pileated woodpecker habitat as this is an important habitat component especially for this species as it potentially transforms to a snag.

Fire suppression has contributed toward creating denser forests. While these conditions may facilitate snag development due to increasing stress, over-stocked stands may in some cases inhibit tree growth which may in the long-term suppress the growth of trees and eventually snag development in the larger size classes, an important attribute for many PCEs. Continued fires suppression may increase fuel loadings, increasing the likelihood of stand replacement disturbance events. In the action alternatives the risk to large scale fire would be reduced (see fire write-up). Large-scale stand replacing fires would not provide source habitat for northern goshawk or pileated woodpecker.

American Marten

The American marten is an MIS for old growth habitats. Below is a summary of American marten ecology important to providing information pertinent to assessing impact of the project on the species. For additional details see Mellen-McLean (2012b) in the analysis file. Also see the body of work led by Evelyn Bull in the Blue Mountains (Bull 2000, Bull and Blumton 1999, Bull et al. 2005, Bull and Heater 2000, 2001a, and 2001b).

American marten are associated with old multi- and single-story, and unmanaged young multi-story structural stages in subalpine and montane forests. Large snags and down logs provide rest and den sites for marten (Wisdom et al. 2000).

In the Blue Mountains, marten selected unharvested, closed canopy (50-75%), old-structure stands in subalpine fir, spruce, grand fir and lodgepole forests (Bull et al. 2005). Stands used by martens had higher densities of large snags (>20 inches dbh), averaging 4.0 snags/acre. Snags used as resting and denning sites average from 26 to 38 inches dbh in eastern Oregon, depending on habitat type (Mellen-McLean et al. 2012).

The American marten is one of the most habitat-specialized mammals in North America (Bull and Heater 2001). Marten in northeastern Oregon exhibited larger home ranges than those found in many studies with an average home range size of 6,714 acres for males and 3,499 acres for females (Bull and Heater 2001). Bull and Heater (2001) recommended managing larger areas (16.78 mi^2 (10,739 acres) per breeding pair) for marten in northeastern Oregon. Martens respond negatively to low levels of habitat fragmentation (>25%, Hargis et al. 1999), and Bull and Blumton (1999) found declines in red –backed voles, red squirrels, and snow shoe hares in fuel reduction harvests, which are primary prey items for martens. Furthermore, martens avoided all harvested stands and stands with less than 50 % canopy closure (Bull et al. 2005).

In addition to providing rest and den sites, down wood is an important component of marten habitat because the primary prey of martens is small mammals associated with down wood. These small mammals include voles (*Microtus sp.*) red-backed voles (*Clethrionomys gapperi*), snowshoe hares (*Lepus americanus*) and squirrels in northeast Oregon (Bull and Blumton 1999, Bull 2000). Subnivean (under snow) spaces created by logs provide marten with access to prey during the winter (Bull and Blumton 1999). Down wood used as den and rest sites in the Blue Mountains averaged 26 inches dbh (Bull and Heater 2000).

Alexander and Waters (2000) observed avoidance by martens of areas within 50 m of roads. Roads also facilitate the removal of snags as fire wood and for safety considerations (Gaines et al. 2003, Bate et al. 2007, Wisdom and Bate 2008). The findings of Godbout and Ouellet (2008) indicate that increasing road density results in lower quality habitat for American martens.

American marten are considered vulnerable in the Blue Mountains by Oregon Department of Fish and Wildlife (http://www.dfw.state.or.us/wildlife/diversity/species/docs/SSL_by_taxon.pdf), however, they are also a hunted species. They are considered "vulnerable" to "apparently secure" in Oregon by NatureServe (http://www.natureserve.org/explorer/servlet/NatureServe). Reduction in amount of late-seral forest and associated large snags and logs, and associated fragmentation of habitat are the main reasons marten are considered vulnerable (Wisdom et al. 2000, Hargis et al 1999).

A viability assessment completed for the LRMP Revision indicates a low to moderate concern for the American marten on the Wallowa-Whitman National Forest. Historically habitat was of moderate to low abundance with gaps in distribution, and these currently conditions are similar at the scale of the Forest currently (Wales et al. 2011).

These levels of viability are defined as: Low concern for viability – Current habitats are of moderate or higher abundance and quality relative to historical conditions, and are widely distributed or if gaps in distribution are present they are similar to historical distribution of habitat.

Moderate concern for viability – Current habitat is of lower abundance and/or quality relative to historical conditions. Habitat is moderately well distributed across the planning area but likely with gaps that may limit intra-specific interaction of species with low dispersal ability. For some species with relatively narrow habitat associations and/or patchy distribution, this may have been the historical condition. Habitat quality factors or risks may increase concerns for species viability as amount and distribution of habitat departs from historical conditions.

Existing Conditions for American Marten

Potential habitat for Marten in the Lower Joseph project area is limited. Currently there are 13,000 acres of potential habitat (Moist PVG) of which about 2,200 acres of source habitat in the project area (17% of the potential). Source habitat was described as those stands in moist forest with predominantly large trees (>=21"), and closed canopy conditions (>=60%).

The HRV for this habitat is displayed in Table 12. The HRV was developed from Countryman and XXX (2009), and reported in Wales et al. (2011).

Table 12 – HRV for Marten habitat on the Wallowa-Whitman NF (Wales et al. 2011).

HRV			
Moist_Large Tree_Closed Canopy			Lower Joseph Project Area
Low	Median	High	Existing Condition
19%	24%	29%	17%

Currently the project area contains about 17% of the potential as source habitat, which is just below or at the lower HRV for this habitat type.

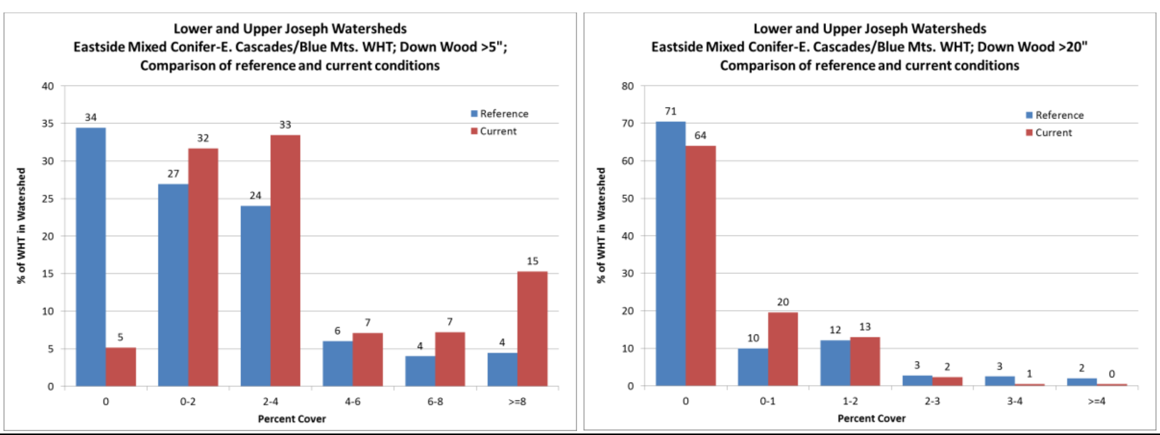
As discussed in the Dead and Defective Habitat section above, densities of large snags (>20 inches dbh) in the EMC WHT (Moist Pvg) are below reference conditions in the snag density classes that provide habitat for American marten (Figures X and XX). Snag habitat is likely to be a limiting factor for marten in these habitat types.

Table [13]. Tolerance levels for American marten occurring in the EMC Wildlife Habitat Type (From DecAID Table EMC_S/L.sp-22)

Species	Snag density/acre for 30%, 50%, 80% tolerance levels	
	Green Forests	
	>10" dbh	>20" dbh
American Marten	11.8, 12.8, 14.4	3.7, 4.0, 4.5

Figure [8]. Comparison of reference condition to current condition for snag density classes in the EMC WHT portion of the Lower Joseph Project Area. Figure A displays down wood > 5" dbh; figure B displays downwood > 20" dbh.. Reference condition derived from DecAID unharvested vegetation plots in the Blue Mountains.

A) B)



Effects to American Marten

Mitigation Measures:

Wild - 24

Because marten habitat is at the lower end of the RV, any harvesting within marten habitat (moist forests, large tree, closed canopy) is designed to maintain old forest characteristics. Canopy closure will remain >=60%, and no harvest of trees >=21" dbh in marten habitat. Maintain snags and large down wood that American marten need for denning, rest areas, and hunting. Large broken top and potentially hollow grand fir would be maintained for denning habitat.

Follow Dead and Defective wood and Large tree mitigations to protect large trees, snags and down wood during both harvesting and prescribed burning activities.

Effects assume project design criteria Wild-1-14 , and Wild-24 (Appendix J) would be implemented. These mitigation measures include protection measures for large trees, large snags, down-logs during harvest and burning activities. Snags >=12" are only to be removed due to safety considerations. Harvest of large trees is allowed only in Alternative 2 and on approximately 5,100 acres, excluding areas within MA15s, PFA's, and cool-moist large tree – closed canopied forests. Wild-24 states: Because marten habitat is at the lower end of the RV, any harvesting within marten habitat (moist forests, large tree, closed canopy) is designed to maintain old forest characteristics. Canopy closure will remain >=60%, and no harvest of trees >=21" dbh in moist, large tree, closed canopied forests. Maintain snags and large down wood that American marten need for denning, rest areas, and hunting. Large broken top and potentially hollow grand fir would be maintained for denning habitat.

Alternative 1 - Because management activities would not take place under Alternative 1, there would be no direct effects on marten source habitat in the short term. The amount of source habitat in the project area, currently at the low end of the HRV, will likely increase through time as trees continue to grow, canopy closure increases and the abundance of large trees and snags increase (Table 13).

Due to the high abundance of adjacent primarily dry forests with uncharacteristic closed-canopied forests, there is an increased risk of insect infestation and mortality as well as increased susceptibility to disease as well as fire. Both standing and down fuels would continue to increase over time as trees die due to competition or insects. This would increase snags and down wood, which are beneficial to marten, but could increase the severity of a wildfire, should one occur. Effects from a stand replacing fire could convert marten habitat to an unsuitable condition.

The abundance of open roads across the planning area would be reduced from existing conditions in Alternative 1. Removal of snags for fire-wood and safety would be reduced as effective road closures are implemented across the planning area. Approximately 52 miles of roads that are currently open would be closed in Alternative 1, potentially leading to an increase in habitat quality through snag retention along roads and decreased human disturbance.

As no change to marten habitat will occur from management activities, and there is a reduction in open roads from existing condition, habitats will remain viable at the forest and at the project scale.

Alternative 2 – Proposed commercial harvest in the Moist Forests is 3,400 acres, of which approximately 800 acres is within what currently qualifies as marten source habitat (moist – large tree – closed canopy) (Table 13). These 800 acres represents about 38% of the current source habitat for marten in the project area. The prescription on these 800 acres is a combination of GS_Mod (114 acres), STS_High (122 acres), and STS_Mod (582 acres). The design criteria for these prescriptions is to maintain >60% canopy closure, and multi-story conditions; no trees >=21" would be harvested. It is assumed that post-harvest these stands will be maintained as source habitat. It is likely that in the short-term they may meet minimum qualifications as source habitat but the quality of the habitat may be reduced due to reduced complexity and tree density, potential loss of snags and logs due to logging operations and safety.

As discussed in the PCE Habitat section above, densities of large snags (>20 inches dbh) in the Moist forest are below reference conditions in the snag density classes that provide habitat for American marten (Figures X and XX). Snag habitat is likely to be a limiting factor for marten in these habitat types. Harvesting on 3,400 acres of moist PVG will add to a reduction in overall snag habitat, further declining habitat quality for marten in this area.

In Alternative 2 on 114 acres of the marten habitat that is being commercially harvested, is in the prescription 'GS_Mod' (group selection – moderate). Group selections can include openings that are 1-4 acres. As described above, Martens respond negatively to low levels of habitat fragmentation (Hargis et al. 1999), it may be that openings as large as 4 acres will reduce the quality of the habitat for marten. In the longer-term, as trees continue to grow, American marten would continue to use these harvested areas for some or all of their life history functions. Vegetation treatments, in both action alternatives, are assumed to modify fire behavior and reduce the effects of a stand replacement event, thereby potentially retaining source habitat in the long-term.

The potential removal of trees >=21” dbh on 220 acres of Moist forest not currently source habitat for marten in Alternative 2 may negatively affect the long-term recruitment of snag habitat, as these trees will no longer be available as potential snags and down wood. Additionally the harvest of large trees within the Moist forest may lead to a delay in development of source habitat and or lower the quality of potential source habitat in the longer term.

The additional road closure of 17 miles proposed in this alternative relative to the No Action alternative would likely benefit marten. Open roads can contribute to a loss of quality of habitat through loss of snags and downwood due to firewood harvest and safety, and can reduce habitat quality for marten (Godbout and Ouellet 2008).

Treatment units remain outside a larger block of moist larger tree structure within and adjacent to the MA15 located along Peavine Ck, perhaps providing some protection to this area by lessening the risk for high severity fire.
The overall direct, indirect and cumulative effects will result in a small negative trend of habitat quality. The loss of habitat quality will be insignificant at the scale of the Forest and will likely be short-term. The Lower Joseph Project is consistent with the Forest Plan, and thus continued viability of the American marten is expected on the Wallowa-Whitman National Forest.

Alternative 3 – Proposed commercial harvest in the Moist Forests is 2,700 acres, of which 730 acres is within what currently qualifies as marten source habitat (moist – large tree – closed canopy) (Table 13). These 730 acres represents about 33% of the current source habitat for marten in the project area. The prescription on these 730 acres is a combination of GS_Mod (108 acres), STS_High (122 acres), and STS_Mod (499 acres). The design criteria for these prescriptions is to maintain >60% canopy closure, and multi-story conditions; no trees >=21” would be harvested. It is assumed that post-harvest these stands will be maintained as source habitat. It is likely that in the short-term they may meet minimum qualifications as source habitat but the quality of the habitat may be reduced due to reduced complexity and tree density, and potential loss of snags and logs due to logging operations and safety.

As discussed in the PCE Habitat section above, densities of large snags (>20 inches dbh) in the Moist forest are below reference conditions in the snag density classes that provide habitat for American marten (Figures X and XX). Snag habitat is likely to be an important habitat feature in these habitat types. Harvesting on 2,700 acres will add to a reduction in snag habitat, further declining habitat quality for marten in this area. However, in Alternative 3 there will be no removal of trees >=21” dbh which should be beneficial in long-term recruitment of snag habitat, as these trees will be available as potential snags and down wood.

In Alternative 3 on 110 acres of the marten habitat that is being commercially harvested, is in the prescription ‘GS_Mod’ (group selection – moderate). Group selections can include openings that are 1-4 acres. As described above, Martens respond negatively to low levels of habitat fragmentation (Hargis et al. 1999), it may be that openings as large as 4 acres will reduce the quality of the habitat for marten. In the longer-term, as trees continue to grow, American marten would continue to use these harvested areas for some or all of their life history functions. Vegetation treatments, in both action alternatives, are assumed to modify fire behavior and reduce the effects of a stand replacement event, thereby potentially retaining source habitat in the long-term.

Open road densities would be reduced by about 8 miles from exsisting conditions. As compared to Alt. 1 or Alt. 2, Alt. 3 provides the least protection from human disturbance as measured by miles of open roads. Open roads can contribute to a loss of quality of habitat through loss of snags and downwood due to firewood harvest and safety, and can reduce habitat quality (Godbout and Ouellet 2008).

Treatment units remain outside a larger block of moist larger tree structure within and adjacent to the MA15 located along Peavine Ck, perhaps providing some protection to this area by lessening the risk for high severity fire.
The overall direct, indirect and cumulative effects will result in a small negative trend of habitat quality. The loss of habitat quality will be insignificant at the scale of the Forest and will likely be short-term. The Lower Joseph Project is

consistent with the Forest Plan, and thus continued viability of the American marten is expected on the Wallowa-Whitman National Forest.

Table 13 - Source habitat for American Marten by alternative

American marten	Alternative 1	Alternative 2	Alternative 3	Comment
Source Habitat (acres)	2,178	2,178	2,178	
% HRV	17	17	17	The current condition as well as the outcome of all alternatives, maintain source habitat within the HRV. The HRV for this species is about 19-29% of the potential vegetation.
Acres source habitat with harvest	-	818	729	Acres of marten habitat that has been harvested are likely lower quality.
% source habitat with harvest	-	38	33	Acres of marten habitat that has been harvested are likely lower quality. It is expected that within 10-30 years the habitats that were harvested and are of lesser quality will transition to higher quality source habitat.
Acres of source habitat not commercially treated	2,178	1,360	1,449	Marten habitat that is not harvested, are likely higher quality habitat.
Acres of large (>=21" trees) potentially harvested	-	220	-	Loss of large trees will negatively affect the quantity and quality of current and future habitat for marten.
Miles of road closed and/or decommissioned (from Existing Condition)	53	70	8	The greater the reduction in open roads, the greater the benefit to marten. Removal of snags an important habitat feature is greater along open roads.

Cumulative Effects to American Marten, MIS species

This species is generally associated with structurally diverse, closed –canopied forests with larger tree structures. Additionally marten are associated with down woody debris. Past timber harvesting, firewood gathering and an extensive road system have likely reduced some of these habitat components. Past vegetation management projects have been incorporated into the existing condition to evaluate the current abundance of these structural conditions for this species. Currently within the planning area, source habitat for marten is at the lower end of the RV.

Design criteria within harvest (in both action alternatives) within marten source habitat provide for maintenance of >60% canopy closure and no harvest of trees >=21" dbh.

Outside of source habitat in the moist forests, the reduction in canopy closure due to prescribed harvest would likely be short-term and as the canopy closes, and the trees grow, would likely transition to source habitat for marten. The harvest of trees >=21" (alternative 2) would have a negative cumulative effect on longer-term marten habitat as this is an important habitat component especially as it creates large down-log habitat (see Table XX below?).

Both alternatives would retain snags >12 inches diameter, except those lost for operational reasons or during prescribed burning. This would result in a minor effect since the existing snag component and eventual log component (see cumulative effects for Primary Cavity Excavator MIS for more information on effects to snags/logs).

Fire suppression has contributed toward creating denser forests. While these conditions may facilitate snag development due to increasing stress, over-stocked stands may in some cases inhibit tree growth which may in the long-term suppress the growth of trees and eventually snag development in the larger size classes, an important attribute for many PCEs. Continued fires suppression may increase fuel loadings, increasing the likelihood of stand replacement disturbance events. In the action alternatives the risk to large scale fire would be reduced. Large-scale stand replacing fires would not provide source habitat for marten.

Table XX. Acres and percent of Moist Forest proposed for treatment by alternative, and acres and percent of Moist forest with potential to harvest trees >=21" dbh by alternative.

Total Acres Moist Forest PVG	Acres Vegetation Management (Commercial)	
	Alternative 1	Alternative 2
12,000	0	3,423 (26%)
	Acres with potential removal of 21" trees	
	0	303 (2.3%)

This project will impact marten habitat in the project area. Though some current source habitat will have treatment, the prescription is to maintain these areas as habitat , though likely the quality fo the treated area is of lower quality. Overall, source habitat will remain nearly within the Range of Variation for these species in this project area (Table MartenXAlternative), and at the scale of the Forest (Table Marten_Forest). The HRVfor the Forest for marte is 19-29% (Wales et al. 2011). A viability assessment completed for the LRMP Revision indicates a low to moderate concern for the American marten on the Wallowa-Whitman National Forest. Historically habitat was of moderate to low abundance with gaps in distribution, and these currently conditions are similar at the scale of the Forest currently (Wales et al. 2011).

Table [14]. Summary of impacts to American marten habitat (acres) by Alternative at the scale of the project area as well as the entire Wallowa-Whitman NF.

Source habitat (acres) (% HRV)	Existing	Alternative 2	Alternative 3
Project Area Habitat	2,178 (17%)	2,178 (17%)	2,178 (17%)
Habitat treated but maintained as habitat		818	729
Wallowa-Whitman National Forest* (from Wales et al. 2011)	129, 582 (16%)	129, 582 (16%)	129, 582 (16%)

Conclusions for American Marten

Due to an increase in dense, multi-canopy stands due to fire suppression and past management, habitat for American marten is increasing across the Blue Mountains (Wisdom et al. 2000). However, densities of large-diameter snags (>21 inches dbh) have declined from historical to current levels (Wisdom et al. 2000, Korol et al. 2002).

A viability assessment completed for the LRMP Revision indicates a low to moderate concern for the American marten on the Wallowa-Whitman National Forest. Historically habitat was of moderate to low abundance with gaps in distribution, and current conditions are similar at the scale of the Forest (Wales et al. 2011). Within the project area, the current abundance of source habitat is below the low end of the historical range of variation.

Vegetation treatments, in both action alternatives, are assumed to modify fire behavior and reduce the likelihood of a stand replacement event, thereby potentially retaining source habitat in the long-term. Treatment units remain outside a larger block of moist larger tree structure within and adjacent to the MA15 located along Peavine Ck, perhaps providing some protection to this area by lessening the risk for high severity fire.

The overall direct, indirect and cumulative effects will result in a small negative trend of habitat quality. The loss of habitat quality will be insignificant at the scale of the Forest and will likely be short-term.

The Lower Joseph Project is consistent with the Forest Plan, and thus continued viability of the American marten is expected on the Wallowa-Whitman National Forest.

Rocky Mountain Elk

Existing Conditions for Rocky Mountain Elk

Rocky Mountain elk have been selected as an indicator of habitat diversity, interspersion of cover and forage areas, and security habitat provided by areas of low human disturbance. Elk management on the Wallowa-Whitman National Forest is a cooperative effort between the Forest Service and the Oregon Department of Fish and Wildlife (ODFW). The Forest Service manages habitat while ODFW manages populations by setting seasons, harvest limits, and goals for individual Wildlife Management Units (WMU).

Within the Lower Joseph project area there are parts of 2 WMU: Chesnimus and Sled Springs (Figure X). Table XX shows the recent trend in populations and the management objectives for the two management units. Currently the populations and bull/100 cows ratios are exceeding the management objectives set by ODFW.

According to ODFW (pers. Comm. 2014), the Chesnimnus unit is currently 40% over population management objective with up to 70% of the population occurring on Zumwalt prairie private lands. The ODFW is currently trying to reduce elk numbers and return the elk population to management objective of 3500 by harvesting antlerless elk on Zumwalt private lands. Elk numbers on the National Forests are much below desired levels, so very little antlerless elk harvest occurs on the National Forest portion of the Chesnimnus unit. Managing road density is important for security areas and bull escapement during hunting seasons.

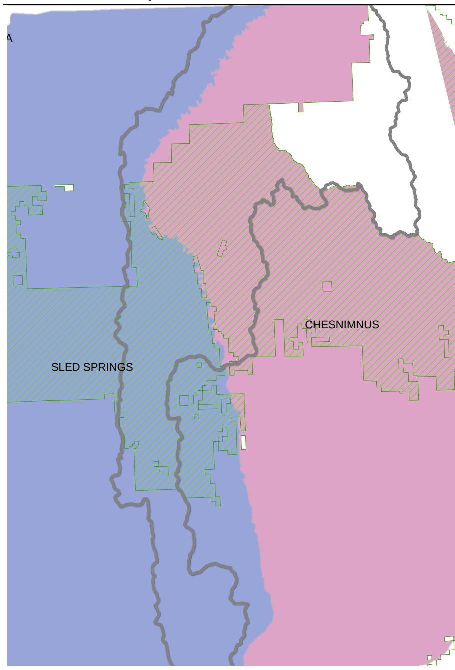


Figure XX – ODFW Management Units within the Lower Joseph project area

Table 3. Population Trend data Rocky Mountain Elk (ODFW 2014)

Management Unit		Population	Bulls/100 cow
Chesnimnus	**MO***	**3,500**	**10**
	2010	3,700	13
	2011	5,300	15
	2012	5,300	13
	2013	5,200	14
	2014	5,000	14
Sled Springs	**MO***	**2,750**	**10**
	2010	2,500	4
	2011	2,700	10
	2012	2,700	10
	2013	3,000	16
	2014	3,100	16

*MO = Management Objective (ODFW)

Research conducted at the Starkey Experimental Forest and Range and associated research sites is providing new insights regarding the importance of maintaining adequate nutritional resources for elk (Cook et al. 2013) , and of minimizing human disturbance effects through effective management of motorized access and cover (Naylor et al. 2009, Rowland et al 2000). Higher nutritional resources are generally concentrated in elk forage areas, defined as areas with less than 40% overhead canopy cover. Highest nutritional resources are often particularly concentrated in areas with less than 20% overhead canopy cover, such as in grasslands, shrublands, and forests of the stand initiation structural stage, recognizing that nutritional resources in these areas will vary with season of elk use and forage phenology.

Elk use of forage areas often depends on their proximity to cover areas (to forest stands with overhead canopy cover 40% or higher) and the distance to roads and trails open to motorized uses. Forage areas within 100 yards of cover areas are most heavily used by elk, as are forage areas farther than 1000 yards from roads or trails open to motorized uses. In addition, maintenance of adequate cover areas provides security for elk during hunting seasons and reduces elk vulnerability to harvest, such that harvest goals for elk can be met but not exceeded. Whether cover areas provide security for elk during hunting seasons, however, often requires motorized closures of large networks of roads and trails during hunting seasons. The need for motorized closures of many road and trail networks to provide effective security for elk during hunting seasons is higher on landscapes dominated by flat, open terrain, and lower in areas of steep, convex topography with more cover.

Desired Condition: In general, a mosaic of forage and cover areas in a given landscape, with minimal or no motorized access through forage areas, results in high to optimal elk use during any given season. This would be the desired condition for landscapes where elk use is promoted, as identified in coordination with state wildlife agencies. For many winter ranges, this desired condition would emphasize the maintenance of existing cover areas, which often compose smaller portions of these landscapes, while also focusing on minimizing or eliminating motorized access and uses on winter ranges during the winter period. For many spring, summer, and fall ranges, this desired condition would emphasize the maintenance of adequate forage areas close to cover and far from roads and trails open to motorized uses. For landscapes where hunting occurs, the desired condition would emphasize motorized access restrictions on roads and trails during hunting seasons to a degree that elk can effectively use cover and topography as security. This approach at managing the desired condition would place more emphasis on motorized closures of roads and trails during hunting seasons for landscapes that are flat and open, and less emphasis on those that are steep and have more cover, as identified in coordination with state wildlife agencies.

In meeting desired conditions for elk, the maintenance of a mosaic of elk forage and cover areas for a given season and landscape will vary with the biophysical potential of each landscape to sustain cover areas, as well as the capability to maintain or enhance adequate forage areas that provide higher nutritional resources far from motorized access. These desired conditions apply to landscapes where high use is promoted, as identified in partnership with state wildlife agencies for each landscape and season of elk use. Not all landscapes or seasons will have a high elk use that is desired, owing to the need to minimize elk damage to adjacent private lands, to reduce fire risk in wildland urban interface (WUI) areas, or to meet other goals of management across mixed land ownerships.

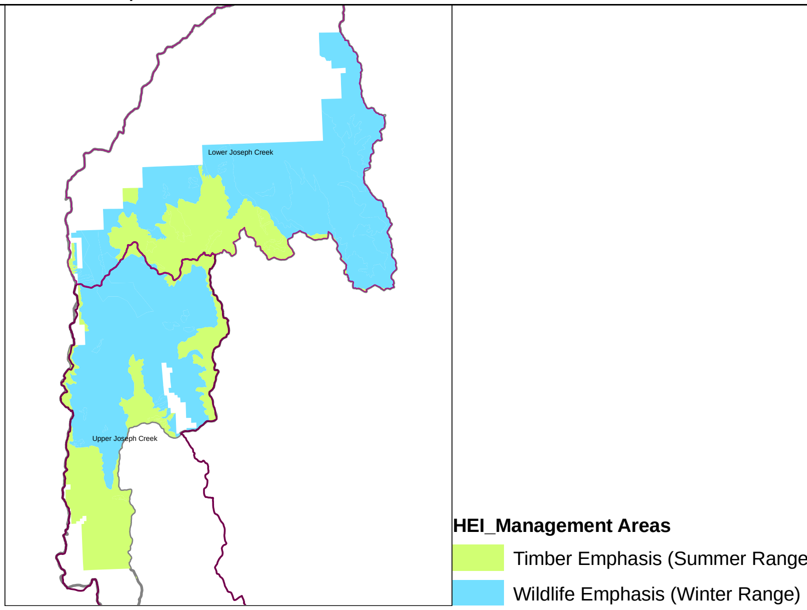
Potential elk habitat effectiveness may be evaluated using the Habitat Effectiveness Index (HEI; Thomas et al. 1988). This model considers the density of open roads, the availability of cover habitat (see definitions; Forest Plan 1990, 4-57), the distribution and juxtaposition of cover and forage across the landscape, forage quantity and quality.

The Forest Plan establishes standards for wildlife habitat, and more specifically elk habitat, on the Forest. The Lower Joseph analysis area provides year round habitat for big game; winter range lies along the northern and western portion of the analysis area, transitional range is mid-slope and summer range lies along the central portion of the analysis area.

Habitat Effectiveness Index: HEI values area based on a comprehensive elk habitat model developed by Thomas et al. (1988). These values consider the interaction of size and spacing of cover and forage areas, density of roads open to vehicle traffic, forage quantity and quality, and the quality of cover. For this report, HEI values were calculated without a forage quality value since actual data does not exist.

The Lower Joseph project area was analyzed using a habitat effectiveness model (Thomas et al. 1988) to assess the quality of elk habitat. The HEI model evaluates size and spacing of cover and forage areas, density of open roads, quantity and quality of forage available to elk and cover quality. Forage data is unavailable and is not included in the total HEI value. To provide for a more landscape-scale approach, and therefore more meaningful results, HEI values were calculated on at the scale of the watershed and 2 main Management Areas distinguishing approximate summer and winter ranges within both the Lower Joseph and Upper Joseph Watershed. The smaller management areas (e.g. MA 15 Old Growth) were lumped into the surrounding larger ‘summer’ or ‘winter’ range.

Currently the Lower Joseph project area is meeting the LRMP direction of HEI >=0.5 in the MA 1(timber emphasis, summer range) areas.



A cover:forage ratio is used to describe the relative amounts of cover to forage and while the optimal ratio of cover to forage is 40:60 (Thomas 1979). The LRMP establishes a minimum standard that at least 30% of forested land be maintained as cover in the 'Timber Emphasis areas (MA1, MA11). For this analysis we defined 'Forage' as areas with <40% canopy closure. 'Marginal' cover is defined as areas with 40-60% canopy cover, and 'Satisfactory' cover refers to areas with >=60% canopy closure. We used these definitions as that was the scale of the data available.

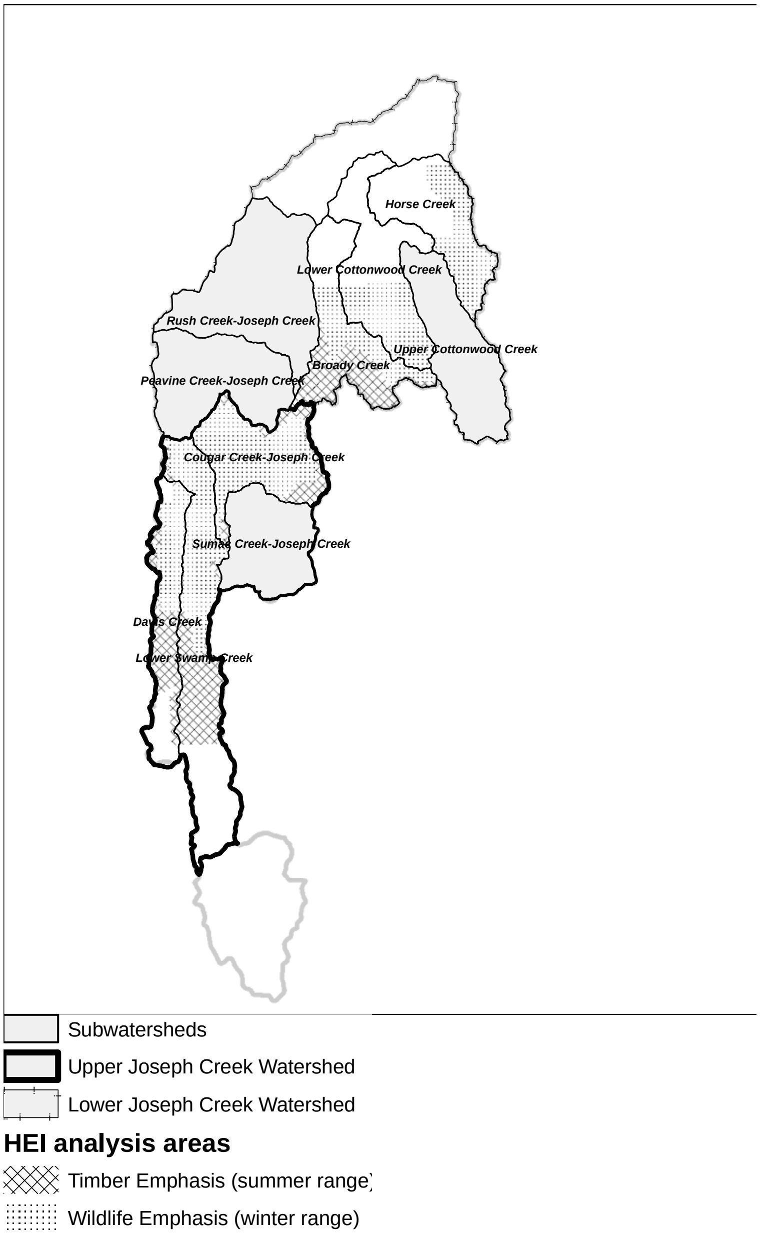
Currently in both the Lower and Upper Joseph watersheds in the summer range there is >=55% cover, in the MA1 (timber emphasis, summer range) areas.

The HEI model developed by Thomas et al. (1988) relies on open road density as an indicator of relative effects from roads on elk habitat. More recent research in northeastern Oregon found that road density is a poor indicator of habitat effectiveness (Rowland et al. 2000). By contrast, the study described a strong linear increase in elk use as distance from roads increased. Therefore, a method using a distance-banding approach, as described by Rowland et al. (2005), is utilized here as an alternate indicator of road effects on elk habitat in the Lower Joseph project area. HEI was calculated using both the habitat effectiveness with the original calculation using road density, and the newer calculation using distance banding.

Table XX –HEI and Cover percentages for the existing conditions within the Lower Joseph project area.

Existing Condition		Timber Emphasis (summer range)	Wildlife Emphasis (winter range)	Timber Emphasis (summer range)	Wildlife Emphasis (winter range)
	FP direction	Lower Josesph Watershed		Upper Joseph Watershed	
Total Cover %	MA 1 >= 30% (summer range)	77%	23%	55%	30%
Cover:Forage		77:23	23:77	55:45	30:70
Marginal Cover %		35%	11%	26%	14%
Satisfactory Cover %		42%	13%	28%	16%
Forage %		23%	77%	45%	70%
Marginal Acres		4,634	4,054	4385	4,081
Satisfacctory acres		5,583	4,901	4,705	4,756
Forage acres		3,047	29,611	7,494	20,344

HEI	MA 1 >= 0.5 (summer range)	0.56	0.63	0.57	0.71
HEI_distance band	MA 1 >= 0.5 (summer range)	0.52	0.56	0.58	0.64



Road Densities

Motor vehicle access and associated human activities are widely recognized as an important factor in how wild, free-ranging elk distribute themselves across available habitat. As the amount and frequency of motor vehicle access increases, habitat effectiveness decreases (Lyon 1983). A literature review by Gagnon et al. (2007) found that 84 percent of 53 literature sources identified an effect to elk from motor vehicle traffic. Gagnon et al. goes on to explain that the remaining 16 percent of sources claiming little effect to elk from traffic cited differences in ungulate populations, ungulate behavior, or landscape variables that explained the reduced effect from traffic. In the book, North American Elk Ecology and

Management (ed. Toweill and Thomas 2002), Lyon and Christensen characterize the body of research showing roads having a "consistent year-round influence" on elk's use of the environment as "overwhelming."

Recreational activities on public lands are increasing as human populations increase, and this growth in disturbance from recreation can decrease animal fitness or expose animals to higher rates of mortality (Knight and Gutzwiller 1995). Since the 1950s, road construction on public lands of the western United States has provided access, resulting in increased use by people in areas that were previously undisturbed (Trombulak and Frissell 2000). Examples of increased recreational activities include mushroom and berry picking, firewood removal, hunting, fishing, driving for pleasure, mountain biking, OHV use, cross-country skiing, back packing, camping, and snowmobiling. Elk move away from roads open to the public (Rowland et al. 2000, 2004) with higher rates of traffic (Wisdom 1998, 2004), away from off-road recreation activities, such as ATVs use and mountain bike riding (Wisdom et al. 2004), and in response to hunting (Conner et al. 2001, Grigg 2007, Vieira et al. 2003, Wertz et al. 2001).

Within this project area there is the Chesnimnus Cooperative Travel Management Area. This is a joint agreement between the Wallowa-Whitman NF and the Oregon Department of Fish and Wildlife where there are identified seasonal road closures. The closures are in effect 3 days prior to the rifle bull elk season through the end of the rifle bull season (approximately 10/25 – 11/27). The objectives of this closure are to protect soils and wildlife habitat, minimize harassment of wildlife, maintain adequate bull escapement, and promote quality hunting.

Additionally, the issue of elk relocating from public land to adjacent private lands with fewer open roads during the spring, summer, and fall is occurring in several places across the Wallowa-Whitman NF. Within the Chesnimnus unit, there is a large segment of the elk population that is currently using the Zumwalt Prairie year –round, this large area is privately owned and adjacent to the NFS. A consequence of large numbers of elk inhabiting private winter ranges year round is that they are not available to the public who wish to hunt or view them on the WWNF during the spring, summer, and fall.

Excessive open road densities have deleterious effects on habitat effectiveness for elk by taking land out of production (1 road mile equals 4 acres of land), reducing the effectiveness of cover and increasing disturbance to elk).

The LRMP direction on Road densities by management areas calculated at a subwatershed is: MA1 <= 2.5 mi/mi2; MA3 <=1.5 mi/mi2; and HCNRA <=1.5 mi/mi2. The road density estimate does not take into account off-road vehicle use on OHV trails, cross-country travel and on closed roads. The current road densities by Management Area per subwatershed for the Lower Joseph project area are shown in Table 33. Currently on 7 out of 10 subwatersheds, open road densities are exceeding LRMP direction.

Table 33. Current road densities by management area and subwatershed in the Lower Joseph project area.

Subwatershed Name	MAS	Areas (Acres, USFS Land Only)	EC_Open Rd Density (mi/mi2)	A1Open Rd Density (mi/mi2)	A2_Open Rd Density (mi/mi2)	A3_Open Rd Density (mi/mi2)
Broady Creek (Lower)	1	5,341	2.8	1.6	1.6	2.8
	3	1,723	1.2	-	-	0.3
	10	3,204	1.4	1.1	1.1	1.1
Cougar Creek-Joseph Creek (Upper)	1	2,818	4.3	3.7	3.3	4.1
	3	10,162	0.9	0.7	0.5	0.9
Davis Creek (Upper)	1	3,994	4.4	4.0	2.9	4.4
	3	3,955	0.2	0.2	0.2	0.2
Horse Creek (Lower)	10	5,770	1.7	1.7	1.5	1.7
Lower Cottonwood Creek (Lower)	10	6,709	0.6	0.6	0.6	0.6
Lower Swamp Creek	1	6,241	3.1	2.6	2.6	3.0
(Upper)	3	8,636	0.3	0.1	0.1	0.3
Peavine Creek-Joseph Creek	1	5,925	2.1	1.1	1.1	2.1
(Lower)	3	5,317	0.2	0.1	0.1	0.2
Rush Creek-Joseph Creek	1	1,958	4.0	3.1	3.1	3.9
(Lower)	3	3,712	0.9	0.5	0.5	0.7
Sumac Creek-Joseph Creek	1	3,559	4.2	3.5	2.9	4.1
(Upper)	3	6,035	1.6	1.3	1.3	1.4
Upper Cottonwood Creek	1	73*	16.1	14.8	14.8	16.1
(Lower)	10	12,176	0.7	0.6	0.6	0.7

*minimal acreage – road density is not meaningful

Effects to Rocky Mountain Elk –

Table – HEI and Cover estimates by alternative

		Timber Emphasis (summer range)			Wildlife Emphasis (winter range)			Timber Emphasis (summer range)			Wildlife Emphasis (winter range)		
		Lower Joseph Watershed			Lower Joseph Watershed			Upper Joseph Watershed			Upper Joseph Watershed		
	FP direction or assumption	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Total Cover %	MA 1 >=30%	77%	63%	64%	23%	18%	23%	55%	40%	42%	30%	25%	26%
HEI	MA 1* >= 0.5 (direction)	0.6	0.63	0.59	0.64	0.62	0.64	0.6	0.58	0.57	0.73	0.71	0.7
HEI _Distance Band	MA 1* >= 0.5 (direction)	0.54	0.57	0.55	0.58	0.56	0.57	0.59	0.57	0.56	0.66	0.63	0.63
*MA1 - generally is the area in Timber emphasis - primarily in th Upper Joseph watershed.													

Table-HEI and Cover estimates by alternative – all values

		Timber Emphasis (MA1 ,summer range)			Wildlife Emphasis (winter range)			Timber Emphasis (MA1, summer range)			Wildlife Emphasis (winter range)		
		Lower Josesph Watershed			Lower Josesph Watershed			Upper Joseph Watershed			Upper Joseph Watershed		
	FP direction /assumption	A1	Alt 2	Alt 3	A1	Alt 2	Alt 3	A1	Alt 2	Alt 3	A1	Alt 2	Alt 3
Total Cover %	>=30% (MA1)	77%	63%	64%	23%	18%	23%	55%	40%	42%	30%	25%	26%
Cover:Forage	(40:60)	77:23	63:37	64:36	23:77	18:82	23:77	'55:45	40:60	42:58	30:70	25:75	26:74
Marginal Cover %		35%	36%	34%	11%	11%	10%	26%	27%	27%	14%	15%	14%
Satisfactory Cover %		42%	27%	30%	13%	7%	12%	28%	13%	15%	16%	10%	12%
Forage %		23%	37%	36%	77%	82%	77%	45%	60%	58%	70%	75%	74%
Marginal Acres		4,634	4,774	4,533	4,054	4,251	3,984	4,385	4,506	4,470	4,081	4,355	4,124
Satisfacctory acres		5,583	3,549	3,971	4,901	2,572	4,731	4,705	2,102	2,523	4,756	2,891	3,448
Total Cover		10,217	8,323	8,504	8,955	6,823	8,715	9,090	6,608	6,993	8,837	7,246	7,572
Forage acres		3,047	4,941	4,760	29,611	31,742	29,840	7,494	9,976	9,590	20,344	21,935	21,609
HEI	MA 1 >= 0.5	0.60	0.63	0.59	0.64	0.62	0.64	0.60	0.58	0.57	0.73	0.71	0.70
HEI _Distance Band	MA 1* >= 0.5	0.54	0.57	0.55	0.58	0.56	0.57	0.59	0.57	0.56	0.66	0.63	0.63

		Timber Emphasis (MA1,summer range)	Wildlife Emphasis (winter range)	Timber Emphasis (MA1,summer range)	Wildlife Emphasis (winter range)
		Lower Josesph Watershed	Lower Josesph Watershed	Upper Joseph Watershed	Upper Joseph Watershed

	FP direction	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Total Cover %	>=30% (MA1)	77%	63%	64%	23%	18%	23%	55%	40%	42%	30%	25%	26%
Loss of cover (to forage) from Existing		-	1,894	1,713	-	2,132	240	-	2,482	2,097	-	1,591	1,265

Mitigation Measures

Wild - 29

Provide hiding cover in accordance with forest plan standards and guides by retaining non-thinned patches of t trees throughout the stand. Avoid placing 'openings' along more heavily used open roads. Areas more critical for hiding cover include flat topography, along main roads (e.g. FS 46, FS 4602, FS 4605, FS 4615, FS 4650, FS 4655, FS 4680), and along fringes of meadows. Hiding cover is defined as vegetation capable of hiding 90 percent of a standing adult deer or elk from human view at 200 feet.

Wild - 30

Winter Range (MA 3): Limit activities associated with this EIS that have the potential to disturb wintering big game. Coordinate seasonal operating restrictions with wildlife biologist if necessary.

Wild – 31

Known calving/fawning areas: Restrict timber harvest, non-commercial thinning, prescribed fire and road work from May 1st to June 30th. In areas not specifically identified for calving and fawning, instruct crews to watch for lone elk or deer. If crews see lone animals, they would search the immediate area for calves and fawns and avoid felling trees or igniting prescribed fire where young animals are discovered.

Effects assume project design criteria Wild-29-31 (Appendix J) would be implemented. These mitigation measures include protection measures to reduce human disturbance during winter and calving season. Additionally Wild-29 provides guidance on retaining hiding cover patches in areas where harvest activities occur.

Alternative 1: Without management activities, elk cover and forage habitat would not be altered and short-term disturbances (associated with treatment activities) to elk habitat would not occur. The overall area providing cover remains higher than either of the two action alternatives. Although, open road densities are lower than the existing condition, road densities in MA 1 would remain high (>3.0 miles/miles2), above Forest Plan standards of 2.5 miles/miles 2 in, Cougar, Davis, and Rush and Sumac Creek although (Table 46). A reduction in open road densities will benefit elk habitat quality.

Alternative 2 – Table 33 summarizes Forest Plan standards for road density by management area, and alternative. The HEI standard of >=0.5 on MA1 is met in both the Lower and Upper Joseph watersheds. The percent cover on the summer ranges remains above 30%, the Forest Plan direction, though is reduced to 40% in the Upper Joseph watershed. The reduced cover will likely lead to increase forage quantity and quality especially in the spring. However, this reduced cover may decrease hiding cover (>=40% canopy closure), particularly in the Upper Joseph watershed and the entire winter range habitat. On winter range habitat, the percent cover is reduced by about 5% in both watersheds (also see 2 Tables describing HEI above). Alternative 2 treats the most area with a reduction of areas in marginal and/or satisfactory cover in the project area – timber emphasis (MA1) on approximately 4,637 acres.

Alternative 2 changes about 7,670 acres of cover to forage across the entire planning area. Both harvest treatments and prescribed burning may also contribute an increase in forage quantity and quality, especially in the spring. Vegetation treatments have been designed to improve the overall landscape structure toward HRV and become more resilient to natural disturbance patterns, and should benefit elk foraging opportunities.

Depending on the implementation schedule over space and time, this project would temporarily increase road density in the analysis area by constructing 12.6 miles of temporary roads and at times open currently closed roads for administrative use. Combined with the loss of cover to harvest and increased human presence, there would likely be a short-term negative impact to habitat effectiveness for elk.

Through the reduction in nearly 70 miles of open roads as compared to the existing condition, open road densities in a two subwatersheds (Rush and Cougar Ck.) remain above 3.0 miles/miles2 in MA1 where the forest plan standard is 2.5 miles/miles2 (Table 46?). Overall the reduction in miles of open roads is greatest in this Alternative (69 miles) as Alternative 3 proposes to reduce miles of open roads by about 3 miles. This reduction in miles of open roads proposed in Alternative 2 will benefit elk in providing security to reach quality forage, and reduce human disturbance thus helping to keep elk from moving to private lands that often have less human disturbance. Additionally of concern within the analysis area is the unregulated OHV and full-sized vehicle use of closed roads, which has been shown to negatively affect elk and elk habitat and has not been accounted for in the HEI calculations.

Research results on the effects of forest restoration treatments (thinning followed by primarily broadcast burning) in northeast Oregon have found that elk will likely respond positively to treatment in the spring due to an increased cover and abundance of some important forage species, while the opposite may be true for during the hotter summer months (Long et al. 2008a, Long et al.2008b). In the summer areas with relatively open canopy cover, most grass species and many forb species have cured or senesced by about mid-July as a result of increased exposure to direct sunlight. Within untreated areas or areas with denser canopy cover, important forage species often persist for several weeks longer. The authors suggest that maintaining a mosaic of treated and untreated forest habitats across the landscape will likely be beneficial for foraging habitat. Recently research has shown that the adequacy of summer nutrition in the Pacific Northwest is an important driver in the productivity of elk and probably other ungulate populations (Cook et al. 2013).

To reduce disturbance to big game on winter ranges timber sale activities, including log haul, considerations to minimize activities during periods of low temperatures and accumulated snow depths, typically from December 15 through March 31st will be taken.

Alternative 3 –

Table 33a summarizes Forest Plan standards for road density by management area, and alternative. Similar to alternative 2 the Forest Plan standards for HEI and percent cover in MA1 areas would be met. The HEI standard of >=0.5 on MA1 is met in both the Lower and Upper Joseph watersheds. The percent cover on the summer ranges remains above 30%. The reduced cover may increase forage quantity and quality especially in the spring. The reduced harvest in alternative 3 provides for more cover across the planning area than in alternative 2.

Alternative 3 changes about 5,300 acres of cover to forage across the entire planning area (about 35% fewer acres than alternative 2). Both harvest treatments and prescribed burning may also contribute an increase in forage quantity and quality, especially in the spring. Vegetation treatments have been designed to improve the overall landscape structure toward HRV and become more resilient to natural disturbance patterns, and should benefit elk foraging opportunities. Alternative 3 proposes a slight reduction in miles of open road as compared to the existing condition. This alternative maintains the nearly 70 more miles of open road than Alternative 2, the other action alternative. In 5 of the 10 subwatersheds, open road densities in MA1 remain above 3.0 miles/miles2, above the forest plan standard of 2.5 miles/miles2 (Table 46?). Additionally one other watershed remains at 2.8 miles/miles2. Higher road densities have deleterious effect on habitat effectiveness for elk by reducing effectiveness of cover and increasing disturbance. Higher open road densities on Forest Service lands have added to the issue of elk relocating on adjacent private lands with fewer open roads. Currently there is a large segment of the elk in the Chesnimnus wildlife unit residing nearly year-round on private lands adjacent to NFS lands. By only minimally reducing road densities in this Alternative, it is likely elk distribution on private lands will remain an issue in this wildlife unit.

Additionally of concern within the analysis area is the unregulated OHV and full-sized vehicle use of closed roads which has been shown to negatively affect elk and elk habitat and has not been accounted for in the HEI calculations.

Depending on the implementation schedule over space and time, this project would temporarily increase road density in the analysis area by constructing 12.6 miles of temporary roads and at times opening closed roads for administrative use. Combined with the loss of cover to harvest, there would likely be a short-term negative impact to habitat effectiveness for elk in some areas at some times.

Together with the loss of cover and higher road densities particularly in the Davis, Lower Swamp Creek subwatersheds, elk distribution and habitat effectiveness may be negatively affected.

Research results on the effects of forest restoration treatments (thinning followed by primarily broadcast burning) in northeast Oregon have found that elk will likely respond positively to treatment in the spring due to an increased cover and abundance of some important forage species, while the opposite may be true for during the hotter summer months (Long et al. 2, Long et al.). In the summer areas with relatively open canopy cover, most grass species and many forb species have cured or senesced by about mid-July as a result of increased exposure to direct sunlight. Within untreated areas, or areas with denser canopy cover, important forage species often persist for several weeks longer. The authors suggest that maintaining a mosaic of treated and untreated forest habitats across the landscape will likely be beneficial for foraging habitat. Recently research has shown that the adequacy of summer nutrition in the Pacific Northwest drives the productivity of elk and probably other ungulate populations (Cook et al. 2013).

Alternative 3 proposes higher miles of open road than in Alternative 2. The project would temporarily increase open roads by about 12.5 miles and reopening many miles closed roads for haul routes. Post-project road densities in 6 out 10 subwatersheds remain above Forest standards, and little change from the existing condition. Excessive open roads have negative effects on habitat effectiveness by taking land out of production, reducing the effectiveness of cover, and increasing disturbance to elk. Additionally of concern within the analysis area is the unregulated OHV and full-sized vehicle use of closed roads which has been shown to negatively affect elk and elk habitat. Together with the loss of cover and higher road densities particularly in the Davis, Cougar Creek, and Sumac subwatersheds, elk distribution and habitat effectiveness may be negatively affected.

To reduce disturbance to big game on winter ranges timber sale activities, including log haul, considerations to minimize activities during periods of low temperatures and accumulated snow depths, typically from December 15 through March 31st will be taken.

Cumulative Effects to Rocky Mountain Elk

Past, present and future management activities have contributed to cumulative effects on big game habitat and consequently distribution of big game populations in the Lower Joseph project area. These activities include: past timber harvesting practices, understory thinning, fire suppression, prescribed fire, wildfires, livestock grazing, road construction, road closures and decommissioning. Cumulative effects from the Lower Joseph project and previous timber harvesting can have both positive and negative impacts to big game habitat. Past changes in structural conditions due to harvest, are incoroporated in the existing condition data. While the increase in forage can be beneficial during late winter, spring, and perhaps summer months, the reduction in cover can have adverse effects on these hunted species during the fall hunting seasons. However, decades of fire suppression has contributed to higher stand densities that are beneficial for big game distribution by providing hiding cover, offsetting cumulative effects of vegetation projects that move timber stands towards historic open forest conditions. Although we are moving the landscape to more open-forested conditions, closer to the RV, overall the landscape would still be above the RV for closed-canopied forests, offering security areas for elk.

Research conducted at the Starkey Experimental Forest and Range and associated research sites is providing new insights regarding the importance of maintaining adequate nutritional resources for elk (Cook et al. 2013) , and of minimizing human disturbance effects through effective management of motorized access and cover (Naylor et al. 2009, Rowland et al 2000).

Current restoration efforts across the WWNF to move timber stands to more resilient forests though creating potential forage for ungulates, some of these areas may not be utilized due to greater distance to cover from open roads, reducing security, and increasing vulnerability to hunting pressure. Because these large treated blocks may lack escape cover and due to forest wide high road densities, elk habitat quality could decline in some localized areas until cover is reestablished. Additionally, loss of cover and higher road densities may lead to displacement of animals onto private lands and conflicts with private land owners. The proposed projects' reduction in cover is offset in Alternative 2 to some degree by road closures allowing for elk security within the project areas. Although Alternative 3 proposes fewer acres harvested, it also proposes few road closures above the existing condition. .

The reduction of cover and road closures are reflected in the HEI analysis for each project. Although there is a large loss of cover, the Lower Joseph project area meets the Forest Plan Standards for HEI in both Alternatives 2 and 3. Project design criteria include measures to provide cover by retaining non-thinned patches of forest trees ('clumps') and avoid placing 'openings' along more heavily used open roads.

Wildfires and prescribed fire may also create quality forage for wild ungulates. Cumulative effects from harvest, thinning, and prescribed fire in the same units can reduce ground cover and concealment for fawns and calves, possibly increasing predation rates.

The Wallowa-Whitman National Forest contains a road network totaling around 9,120 miles of documented roads, of which about 4,630 are open to motorized vehicles. These roads can have adverse cumulative effects to big game and reduce the effectiveness of existing habitat. Additionally, motorized cross county travel is an additional cumulative effect potentially leading to increased disturbance and vulnerability. The effectiveness of road treatments vary depending on terrain and public compliance. Currently in 6 of the 10 subwatersheds road densities are above forest plan standards in MA 1, alternatives 1 and 2 reduce these densities, while alternative 3 has negligle change to the abundance of open roads.

Elk populations are managed by ODF&W and current population objectives are much higher than a minimum level needed to sustain viability. Based on the number of hunt tags issued annually and surplus animals harvested population viability is not a concern. Elk populations on the forest in most hunt units are above or at management objectives. Therefore, the alternatives proposed in the Lower Joseph project are not expected to contribute to a negative trend in elk viability on the Wallowa-Whitman National Forest.

Recreational activities on public lands are increasing as human populations increase, and this growth in disturbance from recreation can decrease animal fitness or expose animals to higher rates of mortality (Knight and Gutzwiller 1995). Since the 1950s, road construction on public lands of the western United States has provided access, resulting in increased use by people in areas that were previously undisturbed (Trombulak and Frissell 2000). Examples of increased recreational activities include mushroom and berry picking, firewood removal, hunting, fishing, driving for pleasure, mountain biking, OHV use, cross-country skiing, back packing, camping, and snowmobiling. Elk move away from roads open to the public (Rowland et al. 2000, 2004) with higher rates of traffic (Wisdom 1998, 2004), away from off-road recreation activities, such as ATVs use and mountain bike riding (Wisdom et al. 2004), and in response to hunting (Conner et al. 2001, Grigg 2007, Vieira et al. 2003, Wertz et al. 2001).

Grazing is an ongoing activity in the project area. While grazing does not affect forest canopies, shrub and grass habitats can be altered by vegetation removal which leads to reduced structural diversity. Under all Alternatives, active grazing allotments could result in ungulate competition for forage especially during late summer. Forage utilization standards are monitored and generally meet Forest Plan standards and guides (see Range specialist report).

Past and present recreational use of the analysis area includes OHV use, fuelwood gathering, small and big game hunting, camping, hiking, mountain biking, and horseback riding. Similar to road building, the use of OHVs off of established roads causes disturbance to wildlife, especially for deer and elk. Big game hunting seasons in the fall results in disturbance to many species, though in the area of the Chesnimuns road closure, this is reduced. Human disturbance on winter range ceases somewhat due to the seasonal restriction in designated areas from December 1st – March 31st.
Fire suppression, especially in the areas of Dry PVG has resulted in certain areas toward more tree density than what used to occur in pre-settlement times. Fire suppression across the watersheds, has helped perpetuate homogenous forest

conditions that lack the structural variety beneficial to many wildlife. Furthermore, fire suppression has placed much habitat for some species at risk of stand replacing fires with the potential to adversely impact habitat that is crucial for their survival.

The proposed vegetative treatments (harvest and burning) will help reduce the adverse affects of continued fire suppression by improving stand structures and composition, and further increase the stands resilience to unnaturally intense disturbances such stand replacement wildfire events, insect infestations, and/or disease. However, for those species which are associated with conditions enhanced by fire suppression (e.g. closed canopies), proposed vegetative treatments, habitats will be reduced.

In those areas where past harvest activities have reduced satisfactory cover to marginal cover or forage and not yet returned to cover, this project and other adjacent projects (NAME?) will add incrementally to these reduced cover acres within the area – reducing security habitat, however, closing roads would likely help to offset this effect by securing blocks of habitat with limited or no motorized access.

Past, planned, and future prescribed burning reduces some habitat over the short term but in many areas will enhance long term habitat and forage as grasses, shrubs, etc regenerate/sprout. There is a potential to affect hiding cover and some overstory cover while burning as well, however, this affect will be minor over all and will leave cover patches as burning occurs in a mosaic which closer represents historical conditions. Prescribed fire is scheduled over many years to avoid over-depleting forage within the area and to rejuvenate grassy areas when they begin to get overgrown and unpalatable.

Unregulated OHV use in the past has lead to the creation of unauthorized trails which contribute to the isolation and interruption of connectivity between habitat features in the project area. Clearing out down fuels/slash may open more areas to cross-country use; however, it is anticipated that when the Forest travel management plan is implemented in the future that cross-country travel will be regulated providing A reduced the for isolation, impacts on vegetation, and the disturbance to species using these habitat features.

Conclusions for Rocky Mountain Elk

The National Forest Management Act (1976) requires that habitat exist to provide for viable populations of all native and desires non-native vertebrates. Elk is a game species that is managed on a management objective (M.O.) basis. Management objectives were developed to consider not only the carrying capacity of the lands, but also the elk population size that would provide for all huntable surplus, and tolerance levels of ranchers, farmers, and other interests that may sometimes compete with elk for forage and space. Biologically, a population that is managed around a M.O. is much larger than a minimum viable population. A minimal viable population represents the smallest population size that can persist over the long term. Historically there were game species, including elk, which warranted serious conservation concerns due to depressed populations and range contractions resulting from unregulated market and sport hunting and loss of habitat. Many of the factors that contributed to the decline of large wild ungulates in the past do not exist today. Currently, elk populations on the WWNF are regulated by hunting and predation. Elk numbers are substantially higher than what would constitute a concern over species viability.

Old-Growth Management Areas (OGMAs), Late and Old-Structure (LOS) Forest Habitat , and Connectivity Corridors

Existing Condition

Allocated Old Growth Management Areas - (MA 15 –OGMAs)

The Forest Plan designated OGMAs (i.e. Management Area 15) and provides Standards and Guidelines (Forest Plan 4-89-91) for their management. Three species were selected in the LRMP to represent Old-growth habitats as Management indicator species: Pileated woodpecker, American marten and Northern goshawk, these species are discussed in the MIS section as well.

There are 31 Forest Plan allocated OGMA's (Forest Plan MA-15) in the Lower Joseph project area. These stands are intended to maintain habitat diversity, preserve aesthetic values, and to provide old-growth habitat for wildlife. In total, the area within these OGMA's is 3080 acres of which 109 acres are not forested, for a total of 2971 forested acres. See table X for a description of the existing structural stages.

Table_MA15_SS: Exisiting structural stages within MA 15's across the planning area

	OFMS	OFSS	YFMS	UR	SE	SI	Total
Dry Acres	913		143	397	417	-	1,870
Moist Acres	567	14	65	281	174	-	1,101
MA 15 Total	1,481	14	208	678	592	-	2,971

Late Old Structure - LOS Habitat

Late and old structure forest habitat is defined by the Eastside Screens as multi-strata stands with large trees and single strata stands with large trees. A large tree is defined as being ≥ 21 inches dbh. Multi-stratum stands are comprised of two or more tree canopy layers and two or more cohorts of trees. Medium and large sized trees dominate the overstory but trees of all size classes may be present. Stand structure and tree sizes are diverse. Single stratum LOS stands are comprised of a single dominant canopy stratum consisting of medium or large sized trees. Large trees are common. Young trees are absent or few in the understory. The stand may appear "park-like."

The Large-open structural stage of the Dry PVG is below the Historical Range of Variability (HRV), defined as conditions in the pre-European settlement area. Refer to the Silviculture specialist report and table 'Table_StructuralStage' for a description of the existing abundance of structural stages in the planning area. Low amounts of OFSS likely limits the abundance of LOS associated wildlife species in the area, such as the flammulated owl, white-headed woodpecker, pygmy nuthatch, white-breasted nuthatch, and brown creeper.

Table_Structural Stage: % area by PVG and structural stage for the existing condition and the alternatives for the planning area.

PVG	Structure	% EC, Alt 1	% Alt 2	% Alt 3	%HRV
Dry	OFMS	20	23	21	5-15
	OFSS	0	6	4	40-60
	YFMS	8	6	7	5-10
	UR	37	39	38	
	SE	18	9	13	10-20
	SI	17	17	17	15-25
Moist	OFMS	30	34	33	15-20
	OFSS				10-20

		0	2	1	
	YFMS	15	14	14	10-20
	UR	21	22	21	
	SE	18	13	14	20-30
	SI	16	16	16	20-30

Connectivity of late seral closed forest habitats

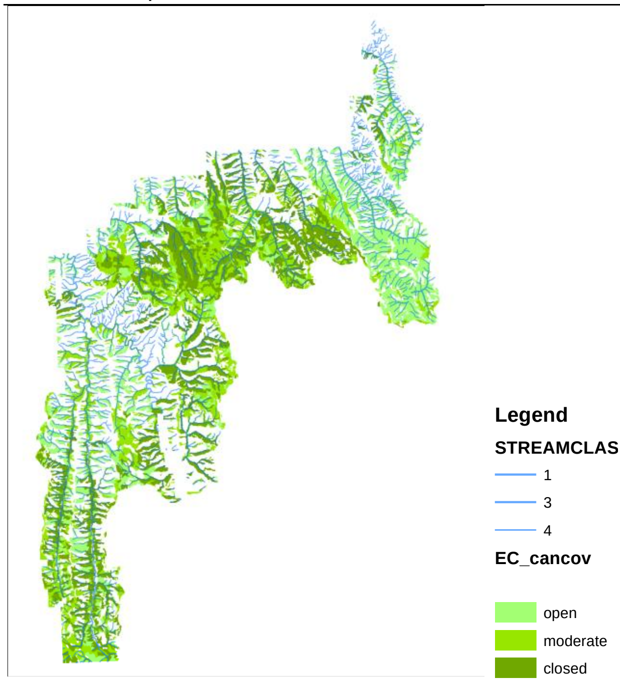
Maintaining connectivity between habitats, particularly late and old structured habitat, is important for numerous wildlife species to allow free movement, interaction of adults, and dispersal of young. Management direction pertaining to maintaining connectivity between late and old structured (LOS) stands, in addition to designated old growth management areas (DOGMA), is provided by the Eastside Screens.

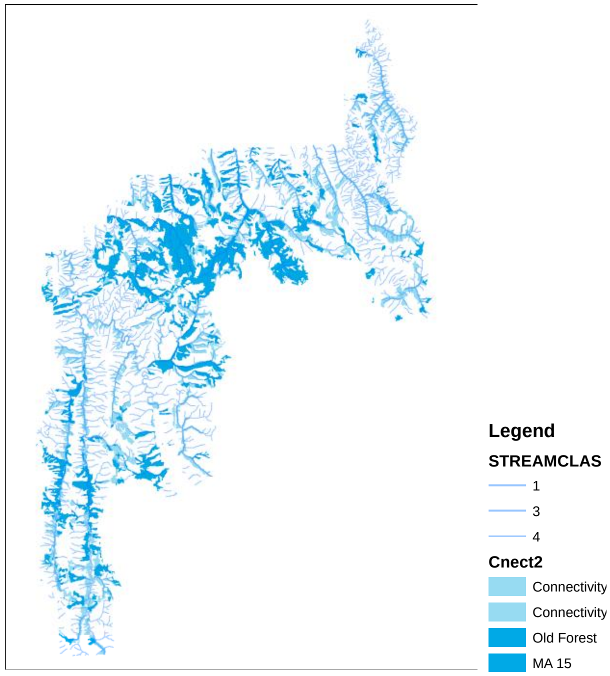
Eastside Screen direction is to maintain or enhance the current level of connectivity between LOS (OFMS/OFSS) stands and between all Forest Plan designated OGMAs (MA15) by maintaining stands between them. LOS stands and OGMAs need to be connected to each other inside the project area, as well as, to adjacent project areas, by at least two directions. Connectivity corridor stands should be those in which medium diameter or larger trees are common, and canopy closures are within the top one-third of site potential. Stand widths should be at least 400 feet wide at their narrowest point. If stands meeting this description are not available then the next best stands should be used for connections. The length of corridors between LOS stands and OGMAs should be as short as possible.

Harvesting is permitted in connectivity corridors if canopy closures are maintained within the top one-third of site potential. Based on an interpretation made on the Forest canopy closures are considered to be within the top one-third of site potential if canopy cover is maintained at or above 40% in the Dry Forest PVG, and 50% in the Moist Forest PVG. This project aims to maintain connectivity, to the extent possible, between all LOS and MA15 stands within and outside the project area according to Forest Plan direction.

The current level of connectivity between MA15 and LOS stands varies across the project area due to areas of non-forested vegetation, past timber harvest, and wildfires. Connectivity between MA-15 "allocated old growth" and late old structure (LOS) stands was assessed utilizing field reconnaissance, aerial photographs and GIS mapping. The current level of connectivity between MA-15 and LOS stands varies across the project area. Areas of non-forested vegetation in combination with past timber harvest and wildfires have created gaps of varying size across the project area. Several LOS stands are currently somewhat isolated by their adjacency to areas non-forested vegetation. Stands of more contiguous forest in the northern portion of the project area are currently well connected (Maps 6,7). Largely connectivity is through major riparian such as Swamp Ck and Davis Ck in the southern part of the project area. This connectivity discussion is pertinent to all wildlife species mentioned elsewhere in this Wildlife Specialist's Report, particularly those that utilize LOS habitat for any part of their life history. Pileated woodpecker, marten and their prey, goshawk and their prey, elk, and a variety of other vertebrates and invertebrates may be affected by the level of connectivity between their source or preferred habitats.

The connectivity network was established based generally on stand boundaries and connects, to the extent possible, all LOS and MA-15 stands within and outside the project area according to direction in the Forest Plan Amendment #2. Figure 55 A: Existing Condition Canopy closure and stream network; B: Existing condition connectivity and LOS habitat





Mitigation Measures

Wild – 32

To maintain wildlife connectivity corridors in the Dry Forest treatment units maintain >=40 canopy closure. In the Moist Forest connectivity treatment units maintain >=50% canopy closure. (Connectivity corridors have been mapped, a map will be provided to the purchaser)

Follow Dead and Defective wood and Large tree mitigations to protect large trees, snags and down wood during both harvesting and prescribed burning activities.

Follow protection measure for known Goshawk nesting areas and post-flegling areas (PFAs).

Alternative1

Old growth management areas, late-old forest habitat, and connectivity corridors

No mechanical vegetation treatments would occur under Alternative 1, and fires would be suppressed.

There would be no direct impacts to MA15, LOS habitat, or connectivity corridors under Alternative 1. Indirectly, this alternative would forgo the opportunity to reduce the likelihood of a high intensity and/or stand-replacing fire through treatments. The current level of connectedness would persist, and would improve in quality for species associated with closed canopied forests in the absence of large scale disturbances. Although connectivity for some species would be enhanced over time, susceptibility to insects, diseases, and wildfire would increase.

LOS habitat for species associated with open-canopied habitats is below HRV and would likely continue to decline without management activity. Risk to uncharacteristic disturbance would continue to increase. Depending the severity and scale of disturbances, habitats for LOS species associated with live trees would decline.

Because management activities would not take place under Alternative 1, there would be no direct effects to old growth and associated wildlife in the short term. In the absence of large scale disturbances, the Lower Joseph analysis area would continue to provide habitat for species associated with closed canopies and larger trees at levels generally within the HRV. Habitats for species associated with open-canopied forests and larger trees would remain below HRV.

Due to the high number of overstocked stands, there is an increased risk of insect infestation and mortality as well as increased susceptibility to disease as well as fire. Both standing and down fuels will continue to increase over time as trees die due to competition or insects. This would increase snags and down wood, which are beneficial to marten, goshawk and pileated woodpeckers, but could increase the severity of a wildfire, should one occur. Few large animals die in wildfires, but fires change habitats, and intense fires change habitat most dramatically (USDA Forest Service 2002). Effects from a stand replacing fire may likely convert wildlife habitat for some species to unsuitable condition and increase habitat for others.

The abundance of open roads across the planning area would be reduced from existing conditions in Alternative 1. Removal of snags for fire-wood and safety would be reduced as effective road closures are implemented across the planning area. Approximately 52 miles of roads that are currently open would be closed in Alternative 1, potentially leading to an increase in habitat quality through snag retention along roads and decreased human disturbance.

LOS habitat for species associated with open-canopied habitats is below HRV and would likely continue to decline without management activity. Risk to uncharacteristic disturbance would continue to increase. Depending the severity and scale of disturbancs, habitats for LOS species associated with live trees would decline.

Alternative 2

Old growth management areas, late-old forest habitat, and connectivity corridors

Old Growth Preservation Areas (MA15)

Alternative 2 includes commercial harvest within portions of 11 designated old growth preservation areas (MA15), on 650 acres (Table 59). Thinning treatments would result in an immediate increase in average tree diameter by favoring dominant and codominant trees. The treatments would also increase average tree diameter by reducing inter-tree competition and improving individual tree growth. Table 54 displays the estimated post treatment size class distribution and the percent change from the existing distribution for the project area under Alternative 2. Areas in MA15 are expected to be consistent with these project-wide trends, with possibly even greater increases in average tree diameter since the cutting of trees ≥ 21" would not be allowed in MA15 areas. Treatment within MA15 is primarily in the dry forest PVG (650 acres, with increases in primarily OFMS, with declines in YFMS and SE). The area in OFSS remains unchanged in MA 15 (Table 60; see Figure 3 for descriptions of structural stages). In harvested areas, the canopy would be reduced, favoring those species associated with more open canopies but the prescriptions would generally maintain canopy closure >40% while also adhering to the direction to maintain old forest characteristics.

Late seral (old) Forest

The abundance of OFMS and OFSS habitat would increase after commercial harvest. In dry forests, OFMS and OFSS would increase by about 9%, and in the moist forests they would increase by about 6%. Although these areas of increase may meet the definition of old forest structures, the canopy closure and structural complexity would be less than the existing conditions.

On approximately 860 acres current OFMS trees ≥ 21" dbh may be harvested, the quality of this OFMS habitat would be reduced by the loss of large trees. Additionally, trees ≥ 21" dbh may be harvested on 1,455 acres, and the harvest prescription would convert the stand from a YFMS or UR to OFMS or OFSS, it is likely that the quality of the old forest habitat created in these areas would be less than if the trees ≥ 21" dbh were not removed.
Commercial harvest would be expected to increase the average dbh of the stand, thus moving the stand to a larger size class.

Alternative 2 includes a proposed forest plan amendment to thin about 30 acres of old forest single story conditions to maintain or enhance existing conditions. This treatment would not change the overall LOS structural conditions. The harvest would reduce the tree density resulting in a more open canopied forest. Open-canopied large tree forest is below HRV and an increase in this habitat would benefit species associated with this structure such as the white-headed woodpecker. The landscape is currently above HRV in closed-canopied forests.

Larger tree structure with open canopies would increase habitat for species such as the Sensitive white-headed woodpecker and Lewis's woodpecker, but would reduce habitat for MIS such as pileated woodpecker and northern goshawk.

Connectivity

Map 6 and Table 61 show commercial treatment within connectivity corridors for Alternatives 2 and 3. Alternative 2 would reduce the quality of connectivity corridors on 23% of areas designated as connectivity by reducing the canopy closure and structural complexity. The prescriptions in the proposed treatment units within the connectivity corridors have been designed to provide canopy closure at ≥40% in the dry forest PVG, and ≥50% in the moist forest PVG. Although canopy closure and structural complexity may be reduced, these stands are expected to maintain the function and objectives of connectivity as described in the Eastside Screens. This level of tree stocking would reduce competition between residual trees, increase tree growth rates, and increase trees' ability to defend against insects and diseases, while retaining levels of canopy closure and structural complexity to facilitate movement of wildlife between LOS habitat patches.

Alternative 2 would allow for prescribed fire across much of the planning area, and 1,230 acres of treatment in seedling/sapling and pole stands within connectivity corridors. Some snags and logs may be consumed by prescribed fire, while new snags and logs are recruited from fire-killed trees. The burning, and small tree thinning in connective corridors would not have a measurable negative effect on the quality or function of the corridors. Fire is an inexact tool, so there is the possibility that some larger woody structures will be consumed, and new ones created as trees are killed. However, prescriptions for fire are designed to retain the larger diameter woody materials, and consume smaller diameter materials.

Table 59. Acres of commercial harvest by potential vegetation group (PVG) within MA 15 in Alternative 2

PVG	Forest Treatment Type	Acres
Dry forest	Single tree selection, old growth, low density (STS_OG_Low)	10
	Single tree selection, old growth, moderate density (STS_OG_Mod)	610
Moist forest	Single tree selection, old growth, moderate density (STS_OG_Mod)	30
Total		650

Table 60. Distribution of structural stages in old growth preservation areas (MA15) currently and by alternative for the LJCRP area

See Figure 3 for a description of structural stages.

	Structural Stage	% Existing and Alternatives 1 and 3	% Alternative 2
Dry forest	OFMS	49	55
	OFSS	0	0
	YFMS	8	3
	UR	21	0
	SE	22	16
	SI	0	0
Moist forest	OFMS	52	51
	OFSS	1	1
	YFMS	6	6
	UR	26	29
	SE	16	13

Table_ssbyAlt – Structural stages and HRV by Alternative

PVG		% EC,	% Alt 2	% Alt 3	%HRV

	Structure	Alt 1			
Dry	OFMS	20	23	21	5-15
	OFSS	0	6	4	40-60
	YFMS	8	6	7	5-10
	UR	37	39	38	
	SE	18	9	13	10-20
	SI	17	17	17	15-25
Moist	OFMS	30	34	33	15-20
	OFSS	0	2	1	10-20
	YFMS	15	14	14	10-20
	UR	21	22	21	
	SE	18	13	14	20-30
	SI	16	16	16	20-30

Table 61. Acres commercially harvested within connectivity corridors by alternative for the LJCRP

Area of Connectivity	Total Connectivity Corridor (Acres)	Alternative 1 % Connectivity Harvested	Alternative 2 % Connectivity harvested	Alternative 3 % Connectivity harvested
Dry forest PVG	9,700	0	20	10
Moist forest PVG	2,500	0	3	2
Total	12,200	0	20	10

Table 61b– Area by PVG of connectivity corridors and areas within connectivity corridors proposed for commercial treatment by Alternative.

Area of Connectivity	Total Connectivity Corridor (Acres)	Alt 1 Commercial Harvest of Corridor (Acres)	Alt 1 % Connectivity Harvested	Alt 2 Commercial Harvest of Corridor (Acres)	Alt 2 % Connectivity harvested	Alt 3 Commercial Harvest of Corridor (Acres)	Alt 3 % Connectivity harvested
Dry PVG	9,736	-	-	2,455	20	1,507	12
Moist PVG	2,495	-	-	310	3	245	2
Total	12,231	-	-	2,765	23	1,752	14

Alternative 3

Old growth management areas, late-old forest habitat, and connectivity corridors

Old Growth Preservation Areas (MA15)

Harvest is not prescribed in MA15 areas in Alternative 3. Changes in structural stage would only occur as a result of natural disturbance processes and continuing fire suppression (Table 60).

Late seral (old) Forest

The amount of OFMS and OFSS in dry and most forests increases by about 5% and 4%, respectively (Table 71). Although these areas of increase may meet the definition of old forest structures, the canopy closure and structural complexity would be less than the existing conditions.

No trees >=21” dbh will be harvested, those late old structure habitats that are harvested will maintain better habitat quality for those species associated with large trees and snags as compared to Alternative 2.

Increases in larger tree structure with open canopies (due to tree harvest) would increase habitat for species such as the Sensitive white-headed woodpecker and Lewis’s woodpecker, but would reduce habitat for MIS such as pileated woodpecker and Northern goshawk.

Alternative 3 includes a proposed forest plan amendment to thin 20 acres in old forest single story conditions to maintain or enhance existing conditions. This treatment would not change the overall LOS structural conditions. The harvest would reduce the tree density resulting in a more open canopied forest. Open-canopied large tree forest is below HRV within the project area, and an increase in this habitat would benefit species associated with this structure such as the white-headed woodpecker. The landscape is currently above HRV in closed-canopied forests.

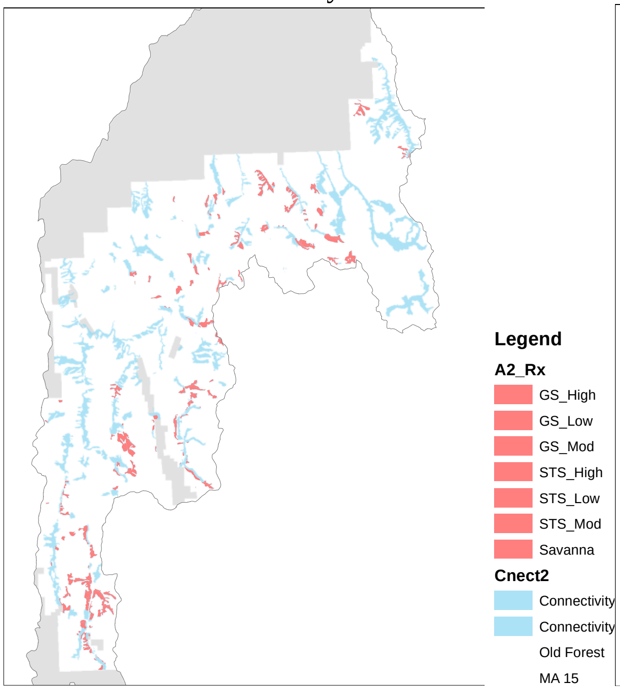
Connectivity

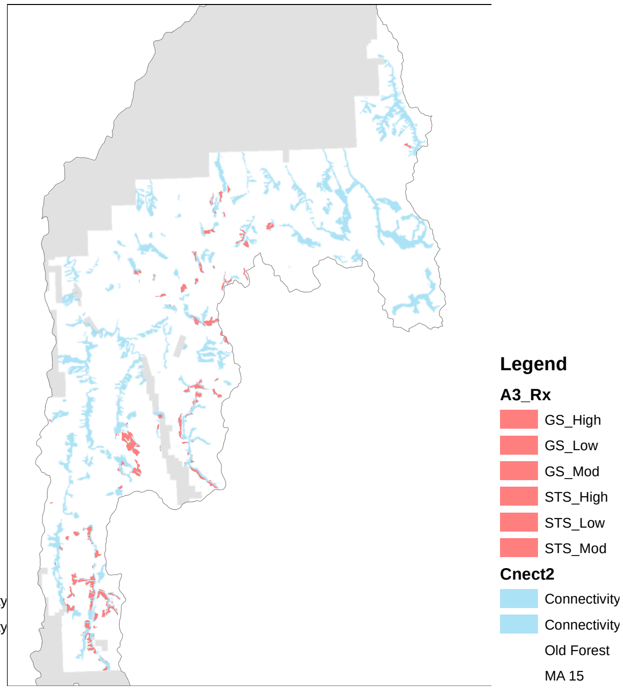
Table 61 summarizes commercial forest vegetation treatments within connectivity corridors for Alternative 3. Alternative 3 would reduce the quality of connectivity corridors on about14% of the areas identified for connectivity. Harvest would reduce the canopy closure and structural complexity. The prescriptions in the proposed treatment units within the connectivity corridors have been designed to provide canopy closure at ≥ 40% in the dry forest PVG, and ≥ 50% in the moist forest PVG. Although canopy closure and structural complexity may be reduced, these stands are expected to maintain the function and objectives of connectivity as described in the Eastside Screens. This level of tree stocking would reduce competition between residual trees, increase tree growth rates, and increase trees’ ability to defend against insects and diseases, while retaining levels of canopy closure and structural complexity to facilitate movement of wildlife between LOS habitat patches.

Alternative 3 would allow for prescribed fire across much of the planning area, and 530 acres of treatment in seedling/sapling and pole stands within connectivity corridors. Some snags and logs may be consumed by prescribed fire, while new snags and logs are recruited from fire-killed trees. The burning, and small tree thinning in connective corridors would not have a measurable negative effect on the quality or function of the corridors.

Connectivity of LOS Habitat

Figure 56 A: Alternative 2 commercial treatment areas of connectivity corridors; B – Alternative 3 commercial treatment areas within the connectivity corridors.





Cumulative Effects

Alternative 1 – The no action alternative will not contribute to cumulative effects. Any effects of forgoing silvicultural treatments and prescribed burning would occur later in time, and are addressed as indirect effects above.

Alternatives 2 and 3 - The reduction in connective habitat quality that results from silvicultural treatments will be relatively short lived as tree canopies respond to the reduced competition, and seedlings establish in response to increased sunlight reaching the forest floor. The quality of connective habitat in treatment units would likely recover to pre-treatment conditions within fifteen years. In the interim, the network of connectivity corridors that is not being treated, including many riparian areas, MA-15 areas, and the matrix of forested habitats will facilitate movement of LOS associated wildlife species between source habitat patches.

Alternative 2 would reduce the quality of connective corridors on about 2,000 more acres than alternative 3.

This approach of addressing connectivity habitat is consistent with direction in the Regional Forester's Forest Plan Amendment #2 to retain canopy closure in the upper 1/3 of site potential, and other criteria that define connective corridors.

The incremental effects of prescribed burning, non-commercial thinning, and mechanical fuels reduction, would not compromise the quality or function of connective corridors.

Migratory Birds

Migratory birds are those that breed in the U.S. and winter south of the border in Central and South America. Many of our well known passerine songbirds, flycatchers, vireos, swallows, thrushes, warblers, and hummingbirds, fall in this category. Most others are included in the resident category. Birds are a vital element of every terrestrial habitat in North America. Conserving habitat for birds will therefore contribute to meeting the needs of other wildlife and entire ecosystems.

Conditions within the Planning Area

Vegetation of the Northern Rocky Mountains has changed dramatically in the last 150 years since European settlement of the region. Primary changes have been the loss of old forest habitat due to intensive timber harvesting, and the degradation of habitats (e.g., ponderosa pine forest, riparian) from a number of factors including fire suppression, over-grazing, invasion of exotic vegetation, and human development. The loss and alteration of historic vegetation communities has impacted landbird habitats and resulted in species range reductions, population declines, and some local and regional extirpations.

Road-associated factors that negatively affect some species of migratory and resident birds include: snag and log reduction, habitat loss and fragmentation, negative edge effects, harassment or disturbance, collisions, displacement or avoidance, and chronic negative interactions with humans (Gaines et al. 2003).

Trends

The Breeding Bird Survey (BBS) (Robbins et al. 1986) is the primary source of population trend information for North American landbirds. However, it only has data for the last 30 years, and extensive habitat changes occurred prior to that time which undoubtedly affected bird populations, but for which there are no quantitative data. Attempts to assess the extent of bird population changes prior to the BBS have been documented through an examination of historical habitats at the time of European settlement (approximately 1850) and knowledge of bird species habitat relationships (Wisdom et al. in press). There is one BBS Physiographic Region within the geographic boundaries of this conservation strategy - ***Central Rocky Mountains***. This BBS physiographic region occurs mostly outside of Oregon and Washington, including parts of Idaho, Montana, and Colorado. Thus, BBS population trend estimates should be viewed cautiously because they may not reflect populations in Blue Mountains of Oregon and Washington.

BBS Significantly Declining Trends -Rocky Mountain physiographic province
Ruffed Grouse (L)
Olive-sided flycatcher (L)
Dark-eyed junco (R)
Brown creeper (L,R)
Mountain chickadee (R)
Townsend’s solitaire (R)
Common snipe (R)
Calliope hummingbird (R)
Red-eyed vireo (L,R)
Yellow warbler(L)
Kildeer(R)
Mourning dove (L)
American kestrel (R)
Black-billed magpie (L)
Barn swallow (R)
Tennesee warbler (R)

Bobolink (R)
L= long-term trend (1966-1998); R= recent trend (1980 – 1998), species identified in red do not occur within the planning area and will not be addressed further.

PIF Bird Conservation Plans:
The Oregon and Washington Chapter of PIF was formed in 1992 and has since developed a series of publications aimed at assisting private, state, tribal and federal agencies in managing for landbird populations.

Five avian conservation plans have been developed by PIF covering the various geographic regions found in Oregon and Washington. These documents have been prepared to stimulate and support a proactive approach to the conservation of landbirds throughout Oregon and Washington. Recommendations included in the documents are intended to inform planning efforts and actions of land managers, and stimulate monitoring and research to support landbird conservation. They also serve as a foundation for developing detailed conservation strategies at multiple geographic scales to ensure functional ecosystems with healthy populations of landbirds.

The plans can be found on the OR-WA PIF web site at **www.orwapif.org.** The Plan reviewed and incorporated for this project is: *Conservation Strategy for Landbirds in the Rocky Mountains of Eastern Washington and Oregon*

PIF Bird Conservation Regions (BCR'S) - Bird Conservation Regions (BCRs) are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues. BCR's are a hierarchical framework of nested ecological units delineated by the Commission for Environmental Cooperation (CEC). The overall goal of these BCR's are to accurately identify the migratory and resident bird species (beyond those already designated as federally threatened or endangered) that represent our highest conservation priorities by ecoregions. BCR lists are updated every five years by the US Fish and Wildlife Service. The BCR that is within the planning area is BCR 10 the Northern Rocky Mountain's.

In December, 2008, the U.S. Fish and Wildlife Service released *The Birds of Conservation Concern Report* (BCC) which identifies species, subspecies, and populations of migratory and resident birds not already designated as federally threatened or endangered that represent highest conservation priorities and are in need of additional conservation actions.

While the bird species included in *BCC 2008* are priorities for conservation action, this list makes no finding with regard to whether they warrant consideration for Endangered Species Act (ESA) listing. The goal is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions. It is recommended that these lists be consulted in accordance with *Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds."*

The following Table lists the birds of conservation concern for the Northern Rockies BCR. The Conservation Strategies for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington, as well as the Fish and Wildlife Service (FWS) BCC species list for the project area were reviewed and incorporated into this analysis (BCC 2008).

Birds of Conservation Concern BCR 10 (Northern Rockies U.S. portion only)
Bald Eagle (b)
Swainson's Hawk
Ferruginous Hawk
Peregrine Falcon (b)
Flammulated Owl
Black Swift
Calliope Hummingbird
Lewis's Woodpecker
Williamson's Sapsucker
White-headed Woodpecker
Olive-sided Flycatcher
Willow Flycatcher (c)

Cassin's Finch
Upland Sandpiper
Long-billed Curlew
Yellow-billed Cuckoo (w. U.S. DPS) (a)
Loggerhead Shrike
Sage Thrasher
Brewer's Sparrow
Sage Sparrow
McCown's Longspur
Black Rosy-Finch

Figure 1: (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Tor E species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR. Those species hi-lighted in red are not known to occur, nor is habitat present within the planning area, and will not be addressed further

Table XX – List of Birds of concern from BBS, BCC, and Forest service Sensitve and a habitat description.

Common Name	Breeding Bird Survey (BBS) - declining trends	Bids of Conservation Concern (BCC)	Forest Service Sensitive	**Habitat Group 1**	**Habitat Group 2**	Habitat description
Brown creeper	BBS (L,R)			Cool/Moist Forest	Medium/Large Trees	In the Pacific northwest prefers late successional stages of moist coniferous forests with high canopy cover.
Cassin's Finch		BCC		All Forest Communities	Medium/Large Trees	Open, mature coniferous forests of lodgepole and ponderosa pine, aspen, alpine fir, grand fir and juniper steppe woodlands
Williamson's Sapsucker		BCC		All Forest Communities	Medium/Large Trees	E. Cascades, mid to high elevation, mature open and mixed coniferous - deciduous forests. Snags are a critical component.
Mountain chickadee	BBS '(R)			All Forest Communities	Medium/Large Trees	Occurs in coniferous forests. Forage high in the canopy and in larger trees.
Ruffed Grouse	BBS (L)			All Forest Communities	Medium/Large Trees/ MOSAIC	Mosaics of dense cover and openings, riparian areas.
White-headed Woodpecker		BCC	Sensitive	Dry Forest	Medium/Large Trees	Nesting habitat consists of open-canopy stands with mature and overmature ponderosa pine.
Flammulated Owl		BCC		Dry Forest	Medium/Large Trees	Associated with ponderosa pine forests and mixed conifer stands with an open canopy, open understory with dense patches of saplings or shrubs.
Calliope hummingbird	BBS ('R)	BCC		All Forest Communities	Open Forest	Predominantly a montane species found in open shrub sapling seral stages (8-15 years) at higher elevations and riparian areas.
Townsend's solitaire	BBS ('R)			All Forest Communities	Open Forest	Breeds in and near open coniferous forest stands, natural forest openings, burned areas, shelterwood cuts and clearcuts.
Dark-eyed junco	BBS ('R)			All Forest Communities	Open Forest	Forages and nests on or close to the ground and is associated with forest openings and patches of early seral vegetation.
American kestrel	BBS ('R)			Post-Fire Habitat	Open Forest	Wide variety of open to semi open habitats, including meadows, grasslands, deserts, early successional communities, open parkland, agricultural fields. Suitable nest trees and perches required.
Olive-sided flycatcher	BBS (L)	BCC		Post-Fire Habitat	Open Forest	Open conifer forests (< 40 % canopy cover) and edge habitats where standing snags and scattered tall trees remain after a disturbance.
Lewis's Woodpecker		BCC	Sensitive	Post-Fire Habitat	Open Forest	Primary habitats include open ponderosa pine, riparian cottonwood, and logged or burned pine.
Peregrine Falcon		BCC	Sensitive	Habitat Generalist	Human Disturbance	Wide range of habitats, nests on cliff ledges, bridges, quarries. Suitable nesting habitat consists of cliffs, usually within 900 meters of water (Pagel 1995)

Ferruginous Hawk		BCC		Woodland/Grass /Shrub	Woodland/Grass/ Shrub	Occupy habitats with low tree densities and topographic relief in sagebrush plains of the high desert and bunchgrass prairies in the Blue Mtns.
Mourning dove	BBS (L)			Woodland/Grass /Shrub	Woodland/Grass/ Shrub	Habitats range within open forests and clearcuts, grass, shrub, juniper-steppe, agriculture and agricultural areas.
Black-billed magpie	BBS (L)			Woodland/Grass /Shrub	Woodland/Grass/ Shrub	Habitats typified by open country, ranch and agricultural lands, juniper woodlands, sagebrush steppe, and open meadows and riparian thickets.
Swainson's Hawk		BCC		Woodland/Grass /Shrub	Grassland	Found in open country with no need for numerous trees prefer prairies and irrigated farmland with high prey densities.
Killdeer	BBS ('R)			Woodland/Grass /Shrub	Grassland	Open areas with short and/or sparse vegetation or bare ground.
Black Swift		BCC	Sensitive	Riparian	Waterfall	Nests on ledges or shallow caves in steep rock faces and canyons, usually near or behind waterfalls and sea caves. Forage over forests and open areas in montane habitats.
Bald Eagle		BCC	Sensitive	Riparian	Riparian/lg tree or snag/open water	Associated with large bodies of water, forested areas near the ocean, along rivers, and at estuaries, lakes and reservoirs.
Willow Flycatcher		BCC		Riparian	Shrubby/Deciduo us Riparian	Associated with riparian shrub dominated habitats, especially brushy/willow thickets. In SE WA also found in xeric brushy uplands.
Red-eyed vireo	BBS(L,R)			Riparian	Shrubby/Deciduo us Riparian	Riparian forests consisting of large black cottonwood, or other deciduous species with understories of chokecherry, willow, alder, hawthorn, and hackberry.
Yellow warbler	BBS (L)			Riparian	Shrubby/Deciduo us Riparian	Riparian woodlands particularly those dominated by willow or cottonwood,
Barn swallow	BBS ('R)			Riparian	Shrubby/Deciduo us Riparian	Breeding habitat usually contains open areas (fields, meadows) for foraging, nest site that includes a vertical or horizontal substrate (often enclosed) underneath some type of roof or ceiling, and a body of water that provides mud for nest-building
Common snipe	BBS ('R)			Wetland	Marsh/Wet Meadow	Wet meadows, marshes, of sedge or grass, cattail marsh edges or riparian bogs.

Table XX – Migratory birds effects by Alternative

Common Name	Habitat Group	Existing Condition	Alternative 1	Alternative 2 and 3
Brown creeper	Cool/Moist Forest _Medium/Large Trees	These habitats are currently at the low end of the RV..At the landscape scale, there is a risk of uncharacteristic fire which would remove habitat for this species.	These habitats are currently at the low end of the RV. Habitat would be provided at the same level that currently exists. At the landscape scale, the risk to uncharacteristic fire which would remove habitat for this species would continue to increase. The reduction in open road densities as compared to the existing condition will likely be beneficial for this species.	Prescribed harvest prescriptions are to maintain habitat abundance though the quality of the habitat in the short-term may be reduced due to loss of canopy cover. Alternative 2 proposes to harvest more habitat for species in this group than Alternative 3.Not harvesting within the RHCAs or trees >=21" dbh in Alternative 3 will benefit this species habitats. At the landscape scale, the risk of uncharacteristic fire which would remove habitat for this species would be reduced. Prescribed fire in source habitat would likely adversely affect habitat for this species. Alt. 2 closes 70 miles of roads as compared to 8 miles in Alt. 3, providing the most benefit for this species.
Cassin's Finch Williamson's Sapsucker Mountain chickadee Ruffed Grouse	All Forest Communities _ Medium/Large Trees	Medium/large tree habitat (>15" dbh) is overall within the RV. In relation to the RV, moist forests are low in closed canopied conditions, while dry forests are low in open canopied conditions. Large snag density is below the RV in moist forests. Shrubby understory habitats may be suppressed particularly in the dry forests. At the landscape scale, there is a risk of uncharacteristic disturbance; these species would likely respond negatively to wildfire depending on the intensity.	Medium/large tree habitat (>15" dbh) is overall within the RV. In relation to the RV, moist forests are low in closed canopied conditions, while dry forests are low in open canopied conditions. Alternative 1 would provide habitat at existing conditions. Snag habitat would remain unchanged. Shrubby understory habitats would likely remain suppressed particularly in the dry forests. At the landscape scale, the risk of uncharacteristic disturbance for these species would continue to increase; these species would likely respond negatively to wildfire depending on the intensity. The reduction in open road densities as compared to the existing condition will likely be beneficial for these species.	Commercial harvest would reduce the canopy closure, the density of medium size trees, and the density of snags. Alt. 2 will also reduce the density of large trees (5,135 acres). Habitats or species associated with open canopies and/or shrubby understories especially in the dry forests will increase and will move closer to the RV. For species associated with closed canopies, habitat will be reduced. Alt. 2 will reduce the canopy closure, snags, and large trees on more acres than alternative 3. At the landscape scale, the risk of uncharacteristic fire would be reduced. A large scale and high intensity disturbance, would likely remove habitat for these species. Prescribed fire in source habitat would likely adversely affect habitat for these species. Alt. 2 closes 70 miles of roads as compared to 8 miles in Alt. 3, providing the most benefit for these species.
White-headed Woodpecker Flammulated Owl	Dry Forest _ Medium/Large Trees	Habitats for these species are below the RV. At the landscape scale, there is a risk to uncharacteristic disturbance. A mixed severity fire may create source habitat for white-headed woodpeckers.	Habitats for these species are below the RV. Snag habitat would not be reduced. Alt. 1 would provide habitat at the same minimal level as current. At the landscape scale, the risk to uncharacteristic fire would continue to increase. A lower intensity or mixed severity fire may create source habitat for white-headed woodpeckers. The reduction in open road densities as compared to the existing condition will likely be beneficial for this species.	Prescribed harvest prescriptions would reduce canopy closure, the density of medium size trees, and the density of snags. Alt. 2 would reduce the density of large trees on 4,915 acres in dry forests. The reduction of canopy will benefit these species. The loss of snags and large trees will decrease the quality of the habitat. Alt. 2 will increase the potential habitat for these species on more acres than Alt. 3. Large trees and snags will be reduced on more acres in Alt. 2 than Alt 3. At the landscape scale, the risk to uncharacteristic fire would be reduced. Depending the scale and intensity of a disturbance, habitat may be created or reduced. Post-fire habitat can provide habitat for white-headed woodpeckers. Prescribed fire in source habitat would likely benefit habitat for these species. Alt. 2 closes 70 miles of roads as compared to 8 miles in Alt. 3, providing the most benefit for these species.

Calliope hummingbird Townsend's solitaire Dark-eyed junco	All Forest Communities _Open Forest	In relation to the RV, moist forests with medium and large trees and forests of early structure (<10") is low in the abundance of open canopied forests. Open-canopied habitats in dry forests are all below the RV. At the landscape scale there is a risk to uncharacteristic wildfire or disturbance would remain high. Lower intensity disturbance, may provide habitat for some of these species, especially the Townsend's solitaire.	In relation to the RV, moist forests with medium and large trees and forests of early structure (<10") is low in the abundance of open canopied forests. Open-canopied habitats in dry forests are all below the RV. Alt. 1 would not change the current amount of habitat that overall is likely reduced. At the landscape scale the risk to uncharacteristic wildfire or disturbance would remain high. Lower intensity disturbance, may provide habitat for some of these species, especially the Townsend's solitaire. The reduction in open road densities as compared to the existing condition will likely be beneficial for these species.	Prescribed harvest will reduce canopy and likely increase habitat for these species. Likely shrub habitat will increase benefitting the Calliope hummingbird. Alt. 2 will reduce canopy closure on more acres than Alt. 3, likely improving habitat for these species more than Alt. 3. At the landscape scale, the risk of uncharacteristic fire would be reduced. Depending the scale and intensity of a disturbance, habitat may be created or reduced. Post-fire habitat can provide habitat for Townsend's solitaire. Prescribed fire in source habitat would likely benefit habitat for these species. Alt. 2 closes 70 miles of roads as compared to 8 miles in Alt. 3, providing the most benefit for these species.
American kestrel Olive-sided flycatcher Lewis's Woodpecker	Post-Fire Habitat Open Forest	Post-fire habitat is currently below the RV. Under Alt. 1 source habitat abundance would not be changed. At the landscape scale the risk of uncharacteristic wildfire or disturbance would remain high. High and moderate intensity/scale wildfire would likely increase habitat for these species.	Post-fire habitat is currently below the RV. Under Alt. 1 source habitat abundance would not be changed. At the landscape scale the risk to uncharacteristic wildfire or disturbance would remain high. High and moderate intensity/scale wildfire would likely increase habitat for these species. The reduction in open road densities as compared to the existing condition will likely be beneficial for these species.	Area within the Cache Ck fire (2012) provides the only recent post-fire habitat. In both Alt. 2 and 3, approximately 167 and 121 acres respectively of that habitat would be commercially harvested. Area with large trees and snags harvested is greatest in Alt. 2, reducing the quality of habitat for these species. At the landscape scale, the risk of uncharacteristic fire would be reduced. These species are associated with post-fire conditions at a variety of scales and intensities.
Peregrine Falcon	Habitat Generalist	Human disturbance is likely the most important factor affecting this species.	The vegetation management proposed is not likely to adversely affect this species. The reduction in open road densities as compared to the existing condition will likely be beneficial for this species.	No vegetation treatments are planned that will likely effect this species. Alt. 2 closes 70 miles of roads as compared to 8 miles in Alt. 3, providing the most benefit for this species.
Ferruginous Hawk Mourning dove Black-billed magpie Swainson's Hawk Killdeer	Woodland/Grass/Shrub	The quality of these habitats are changed from historical primarily due to grazing, invasive species, fire suppression. Depending the scale and intensity of a wildfire, the quality of these habitats could be improved or reduced.	Prescribed fire is the only proposed activity planned in these habitats, in Alt. 1, no prescribed fire would occur. At the landscape scale the risk to uncharacteristic wildfire would continue to increase. Depending the scale and intensity of such a disturbance, the quality of these habitats could be improved or reduced. The reduction in open road densities as compared to the existing condition will likely be beneficial for these species.	Prescribed fire may occur on these habitats in Alt. 2 and 3. Timing and the sizing and spacing of prescribed fire will effect species differently. Prescribed fire conducted prior to the nesting season in the early spring, may reduce nesting habitat for ground- and shrub-nesting species. In the longer term, these habitats may flourish following burning. Alt. 2 closes 70 miles of roads as compared to 8 miles in Alt. 3, providing the most benefit for these species.

Effects Analysis

Mitigation Measures

- **WLD-G11:** Ensure the long-term maintenance of healthy populations of native landbirds by implementing the biological objectives in the Landbird Conservation Strategy (Partners in Flight 2000 as updated). (New) (Typo: WLD-G8 page C-131 in Appendix C HCNRA CMP)
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- **Wildlife S&G-14. Raptor Nest Sites.** Protect all raptor nest sites in use. Protect other nesting sites, important roosting, or special foraging habitats where it can be accomplished without adversely affecting long-term timber production or unreasonably complicating timber sale preparation and related activities. Such means could include adjustments in unit boundaries, operating seasons, or harvest scheduling.
- **Watershed S&G-17.** Address in all project environmental analyses the presence of, and potential impacts to, any wetlands within the project area. Particular attention would be paid to **protection of springs** during road locations, timber sale plan, and range allotment management plans. Adverse impacts to wetlands would be avoided or mitigated.
- **Wildlife S&G-18. Unique habitats.** Avoid alteration of unique habitats such as cliffs and talus slopes. Decisions to alter or disturb these habitats would only be made following site-specific NEPA analysis including identification of suitable mitigation measures. Springs are also considered unique habitats.

- (**Wild12**) To reduce the potential for impacts to nesting landbirds, prescribed burning activities projected to occur on or after May 20, and/or past the onset of vegetation leaf-out, will be reviewed by a district or forest wildlife biologist. The biologist will then provide recommendations concerning prescribed burning after May 20 and/or past the onset of vegetation leaf-out

Effects assume that Project Design Criteria and mitigation measures in Appendix J would be implemented. Several mitigation measures include protections for large snags, trees and down-wood during harvest and prescribed burning activities. In particular, Wild12 states: To reduce the potential for impacts to nesting landbirds, prescribed burning activities projected to occur on or after May 20, and/or past the onset of vegetation leaf-out, will be reviewed by a district or forest wildlife biologist. The biologist will then provide recommendations concerning prescribed burning after May 20 and/or past the onset of vegetation leaf-out

Alternative 1: In the absence of large scale disturbances, alternative 1 would provide long-term habitat for migratory birds at the same level that exists today (See Wildlife specialist's report). Forest fuels would continue to accumulate as fuel reduction treatments are deferred. Alternative 1 would perpetuate and contribute further to increased fuel accumulations, increasing the risks to overstory trees when wildfires occur. Depending on the species and the scale and intensity of wildfires, some species habitats may be improved (e.g. white-headed woodpecker), while other species habitats may be reduced (e.g. Williamson's sapsucker). See Table Migratory birds effects by alternative.

Miles of open roads will be reduced more in alternative 1 as compared to existing conditions which will likely benefit all of these migratory birds. Road-associated factors that negatively affect some species of migratory and resident birds include: snag and log reduction, habitat loss and fragmentation, negative edge effects, harassment or disturbance, collisions, displacement or avoidance, and chronic negative interactions with humans (Gaines et al. 2003). In this alternative, open road densities will be decreased from current more than Alternative 3 but less than in Alternative 2.

Alternative 2 and 3: Effects from this project to migratory birds would be variable depending the species. Alternative 2 will harvest more acres harvested and prescribed burned than alternative 3. In Alternative 2, canopy cover will be reduced more, large trees will be harvested, snags will be reduced more, and riparian areas will be altered. Alternative 3 would harvest fewer acres than alternative 2. Therefore, canopy cover and snags would be reduced on fewer acres. Additionally, riparian areas would not be directly altered, nor would trees >=21" be removed. See Table Migratory bird's effects by alternative.

). A forest plan amendment to harvest trees >=21" dbh (grande fir and Douglas fir) on approximately 5,000 acres in this alternative. Several of the migratory birds of conservation concern are associated with large tree and snag habitat including brown creepers, Williamson's sapscucker, and pileated woodpecker. Harvest of these large tree structures may negatively affect some of these species. However, for those species more highly associated with ponderosa pine (e.g. white-headed woodpecker, flammulated owl), if the harvest of these trees within a close proximity of the ponderosa pine, protects the large pine longevity, there would be a benefit to the wildlife species associated with large pine which is currently below HRV.

Road densities will be reduced more in alternative 2 than any other alternative which will likely benefit all of these migratory birds. Road-associated factors that negatively affect some species of migratory and resident birds include: snag and log reduction, habitat loss and fragmentation, negative edge effects, harassment or disturbance, collisions, displacement or avoidance, and chronic negative interactions with humans (Gaines et al. 2003).
Higher road densities in alternative 3 compared to alternatives 1 or 2 would likely be more adverse for all of these migratory birds.

There will be no new system road construction in the project area and all logging access roads will be closed with earthen berms, water bars, or rehabilitated (scarified, seeded, scattered with debris) after the project is completed. Native seed mixes will be used where available as per Forest Service Policy (FSM 2070.3).

Prescribed fires conducted during the nesting season are more likely to result in high mortality of nestlings, especially for ground, shrub and small tree nesting species (Smith 2000). Prescribed fire conducted prior to the nesting season in the early spring, may reduce nesting habitat for ground- and shrub-nesting species (Artman et al. 2001). Gaines et. al (2007) conducted a study on the east slope of the North Cascades range to determine the response of land birds to forest restoration treatments (including prescribed burning) in ponderosa pine forest. They detected changes in the density of four of five foraging guilds in response to treatments. Tree seedeaters, low understory and ground insectivores, and aerial insectivores all increased in density in treated stands. Overall, bark insectivores showed no density response to treatments. Tree foliage insectivore density was lower in treated than in untreated stands. Overall avian density, density of neotropical migrants, and density of some focal species were higher in treated stands.

In the short-term, some nesting habitat may be lost because of logging and burning, but the scale at which it will occur is not expected to significantly reduce migratory bird richness or abundance. Some birds may experience shifts in home ranges as habitat is altered, but treatments will not result in their complete displacement from the project area. The short-term losses of relatively abundant, early-nesting species, such as the dark-eyed junco, may be a necessary tradeoff for the effective restoration of dry forests. Such losses may be further justified if populations of other species, such as the flammulated owl, white-headed woodpecker, and pygmy nuthatch, ultimately benefit from such restoration. While the long-term overall shift in forest structure would favor species dependent on open canopied forests, this is the forest type that is most outside of the HRV. A mosaic of forest and rangeland conditions capable of supporting breeding migratory bird populations will exist if the project is implemented and move the landscape, thus habitat conditions closer to the HRV. There is no indication that habitat changes from the project would result in reduced numbers of these birds that would be meaningful at local or landscape scales.

CUMULATIVE EFFECTS TO LANDBIRDS INCLUDING NEOTROPICAL MIGRATORY BIRDS

Past timber sales, fires, roads, grazing, and prescribed burns have modified and converted migratory bird habitat in the project area. Past logging has led to the current lack of old, big trees in the area due to selective harvesting, and was likely detrimental to species that depended on contiguous conifer cover and avoided forest edges. Grazing has modified understory fuels and fire suppression has interrupted historic fire return intervals. Consequently, many stands are now overstocked with young trees and are vulnerable to insects, disease, and wildfire.

An extensive road network built to facilitate timber operations has had a long-term impact on the area and continues to provide access for recreationists, hunters, permittees, woodcutters, and others. Roads also facilitate the removal of snags as fire wood and for safety considerations (Gaines et al. 2003, Bate et al. 2007, Wisdom and Bate 2008). Gaines et al. (2003) reviewed 238 articles on the effects of recreation trails and roads on wildlife and found the most commonly reported interactions included displacement or avoidance where animals were reported as altering their use of habitats in response to roads or road networks (Cassier and Groves 1990, Hutto 1995, Johnson et al. 2000, Klein 1993, Mace et al. 1996, 1998). Disturbance at a specific site was also commonly reported and included disruption of animal nesting, breeding, or wintering areas (Linnell et al. 2000, Papouchis et al. 2001, Skagen et al. 1991). Collisions between animals and vehicles were commonly reported and affected a diversity of wildlife species, from large mammals (Gibeau and Heuer 1996, Lehnert et al. 1996) to amphibians (Ashley and Robinson 1996). Finally, edge effects associated with roads or road networks constructed within habitats, especially late-successional forests, were commonly identified (Hickman 1990, Miller et al. 1998).

Grazing is an ongoing activity in the project area. While grazing does not affect forest canopies, shrub and grass habitats can be altered by vegetation removal which leads to reduced structural diversity. A simplification of the vegetation likely causes a shift to generalist species (Knopf 1996). Grazing should not affect migratory bird shrub or grass habitat because grazing according to LRMP standards should leave adequate shrub and grass cover, and is designed to allow for normal recovery rates that do not delay regeneration.

Because the project treatments would begin to shift the project area towards the overall long-term goal of increasing forest resiliency and moving toward HRV, it is not expected to have negative cumulative effects. Treatments are designed to increase open-canopied habitats especially in larger tree structures which are below the HRV. Alternative 3 provides additional large tree structure by retaining all trees greater than 21” DBH.

Burning plans are designed to maximize retention and protection of large diameter live trees, snags, and logs. Open road densities would be reduced in alternative 2 and generally maintained in alternative 3. A mosaic of forest and rangeland conditions capable of supporting breeding migratory bird populations and more similar to the RV would exist if the project is implemented.

Additional risk factors for these species include domestic livestock grazing, invasive plant species and road associated factors. Road-associated factors that negatively affect some species of migratory and resident birds include: snag and log reduction, habitat loss and fragmentation, negative edge effects, harassment or disturbance, collisions, displacement or avoidance, and chronic negative interactions with humans (Gaines et al. 2003).

Conclusions to Landbird and Migratory Bird Habitat

Effects from this project to migratory birds would be variable depending the species. Alternative 2 will harvest more acres harvested and prescribed burned than alternative 3. In alternative 2 canopy cover will be reduced on more acres, large trees will be harvested, snags will be reduced more, and riparian areas will be altered.

Road densities will be reduced more in alternative 2 than any other alternative which will likely benefit all of these migratory birds. Road-associated factors that negatively affect some species of migratory and resident birds include: snag and log reduction, habitat loss and fragmentation, negative edge effects, harassment or disturbance, collisions, displacement or avoidance, and chronic negative interactions with humans (Gaines et al. 2003).

In the short-term, some nesting habitat may be lost because of logging and burning, but the scale at which it will occur is not expected to significantly reduce migratory bird richness or abundance. Some birds may experience shifts in home ranges as habitat is altered, but treatments will not result in their complete displacement from the project area. The short-term losses of relatively abundant, early-nesting species, such as the dark-eyed junco, may be a necessary tradeoff for the effective restoration of dry forests. Such losses may be further justified if populations of other species, such as the flammulated owl, white-headed woodpecker, and pygmy nuthatch, ultimately benefit from such restoration. While the long-term overall shift in forest structure would favor species dependent on open canopied forests, this is the forest type that is most outside of the HRV. A mosaic of forest and rangeland conditions capable of supporting breeding migratory bird populations will exist if the project is implemented and move the landscape, thus habitat conditions closer to the HRV. There is no indication that habitat changes from the project would result in reduced numbers of these birds that would be meaningful at local or landscape scales.

PART2 - Biological Evaluation for Threatened, Endangered and Sensitive wildlife species

INTRODUCTION

As part of the NEPA decision making process, Forest Service programs or activities are reviewed to determine how they may affect any U.S. Fish and Wildlife Service Proposed, Endangered, Threatened, or U.S. Forest Service Sensitive species. The review is conducted to ensure that Forest Service actions do not contribute to a significant loss of species viability or cause a species to move toward federal listing. The review incorporates concerns for sensitive species throughout the planning process, reduces negative impacts to species, and enhances opportunities for mitigation. A biological evaluation (BE) is the means of conducting the review and documenting the findings (FSM 2672.41).

A biological evaluation consists of four steps: Step 1, Prefield Review of existing information to determine if there is evidence or potential for sensitive species and/or their habitats to occur within the area of the proposed project; Step 2, Field Reconnaissance of the project area to locate these species or their habitats; Step 3, Risk Assessment to evaluate the level of risk to species or habitats which may be impacted by the project; Step 4, if insufficient data exists to complete Step 3, a biological investigation may be required so that Step 3 can be completed; a Species Management Guide compiles the information gathered during a biological investigation. (FSM 2672.43)

This BE will address those species determined as sensitive, threatened, or endangered in Oregon by the Region 6 Regional Foresters Special Status Species list 2015. The effects are discussed for all species except those not having habitat and/or not known to occupy the project area. General information on species distribution, habitat, and natural history was gathered from (1) Atlas of Oregon Wildlife (Csuti et al. 2001), (2) Mammals of the Pacific States (Ingles 1990), (3) Birds of the Pacific Northwest (Gabrielson and Jewett 1970), (4) Amphibians of Oregon, Washington, and British Columbia (Corkran and Thoms 1996), and (5) USDA Forest Service field records and biologist observations.

OBJECTIVES

The Lower Joseph vegetation project is proposing harvest and fuels management activities to modify vegetative and fuel conditions. Existing conditions based on vegetation data, and field reconnaissance indicate the project area has a considerable number of stands where natural disturbance processes and associated forest structure and composition are out of balance with historic regimes and conditions. This imbalance includes densely stocked forest stands with extensive understory in-growth and high fuel loading that are at an increased risk to elevated levels of insect activity as well as wildfire. Change to stand structure, composition and fuel levels would alter potential fire behavior characteristics, increase a improve fire suppression options, and improve overall forest resiliency at the stand and landscape level. The need for this project is tied to the altered vegetation and fuel conditions across the landscape resulting from decades of fire suppression and past forest management that has resulted in overstocked stand conditions, hazardous fuels build-up, and increased risk to firefighters.

PROJECT AREA

The “project area” includes only NFS lands (100,000 acres) within the larger analysis area. The analysis area for this DEIS encompasses the entire Lower Joseph Creek watershed, and portions of the Upper Joseph Creek watershed, or as defined specifically by resource, and defines only the area considered in the evaluation of cumulative effects. Alternative management actions analyzed in this DEIS only apply to the project area (i.e., NFS lands only). . There are two inventoried roadless areas (IRAs) located within to the project area along the eastern edge. Land allocations within the project area include timber production, wildlife/timber big game winter range, and old growth as described in the Wallowa-Whitman National Forest Land and Resource Management Plan (U.S. Forest Service 1990).

ALTERNATIVES

Three alternatives were developed for the Lower Joseph project and analyzed to determine the effects to wildlife species and their habitat. A brief description of the alternatives developed for the Lower Joseph project are addressed, however a more complete alternative description can be found in the EA.

Alternative 1 (No Action): This alternative maintains current conditions and serves as a reference point for comparing alternatives.

Alternative 2 (Proposed Action): Alternative 2 was designed to address the purpose and need through maximizing vegetation management treatment within the project area to enhance stand condition and vigor, reduce fuel loadings, and enhance LOS stand structures. In addition to vegetative management projects, access and travel management in terms of closing roads at the completion of the project and obliterating temporary roads to maintain/enhance wildlife, fisheries, recreation, and hydrology resources would occur. In Alternative 2, forest plan amendmants are proposed to harvest trees >= 21" dbh, and harvest within acres proposed for harvest include stands within MA-15, and harvest within some OFSS forests when we are below HRV of this structural stage. Category 4 RHCAs identified for treatment would include the establishment of a 25 foot variable width buffer where there would be no harvest or equipment allowed.

Alternative 3: Alternative 3 does not differ drastically from Alternative 2 and is driven by the same key issues as Alternative 2. 1) Improvement of long term forest health conditions; 2) Deficiency in LOS and departure from HRV; and 3) Modification of potential fire behavior. Alternative 3 does not propose any forest plan amendmants. Vegetation treatments would not occur in IRA's , MA-15s or within any RHCA's. Additionally harvest of trees >=21" would not occur. A forest plan amendment is in place to harvest some OFSS.

PRE FIELD REVIEW

The following proposed, endangered, threatened, or sensitive species (PETS) of wildlife are listed on the Regional Forester's Sensitive Species List (January 2011; Table 2). Only those PETS, or their habitats, known or suspected to occur in or immediately adjacent to the analysis area are addressed in this BE (Table 2).

Table TE_wild_WAW. Proposed Endangered, Threatened or Sensitive species on the Wallowa-Whitman NF.

Species	Habitat within planning area	Desired and current habitat conditions
AMPHIBIANS		
Rocky Mt tailed frog *Ascaphus montanus*	**D**	Rocky Mountain Tailed Frogs (*Ascaphus montanus)* are primarily nocturnal, and live in fast-flowing headwater streams in old-growth forests (Nielson et al, 2001). They occur in very cold, fast-flowing streams that contain large cobble or boulder substrates, little silt, and are often darkly shaded (Bull and Carter 1996). In the LJCRP area, tailed frogs were documented inL Broady, West Fork Broady, East Fork Broady, and Cottonwood Creeks during Forest Service's stream surveys in the 1990s. Other streams that may provide habitat for tailed frogs are Peavine Creek, Rush Creek, Horse Creek, Deadhorse Creek and the Cottonwood tributary south of Deadhorse Creek. Tailed frogs are likely to occur in RHCA categories 1-3 due to the species' need for flowing water at all times. Tailed frogs are not likely to occur in Swamp Creek, as they are found in fast flowing, cold headwater streams.
Columbia spotted frog *Rana luteiventris*	**S**	Columbia spotted frogs are highly dependent on aquatic habitats and require permanent and semi-permanent wetlands that have aquatic vegetation and some deeper or flowing water for overwintering (Bull and Marx 2002, Pilliod et al., 2002). The spotted frog frequents waters and associated vegetated (grassy) shorelines of ponds, springs, marshes, and slow-flowing streams and appears to prefer waters with a bottom layer of dead and decaying vegetation (Bull 2005). These frogs are year-round residents of the Blue Mountains and occur in a number of locations across Northeast Oregon (Bull 2005; Reaser and Pilliod 2005). There have been no surveys specifically for spotted frogs within the LJCRP area but habitat is available and the species may exist along the perennial low gradient streams or ponds in the upper elevations.
BIRDS		
Northern bald eagle	**S**	Bald eagles are highly dependent on riparian habitats. Nesting territories are normally associated with lakes, reservoirs, rivers, or large streams. In the Pacific Northwest recovery area the preferred nesting habitat for bald eagles is predominately uneven-aged, mature coniferous (ponderosa pine and Douglas-fir) stands or large black cottonwood trees along a riparian corridor (NatureServe

Haliaeetus leucocephalus		2012, USDI 1986). No known nest sites exist within the project area. Nearest nest sites are located more than 10 miles from the project area. The project area does contain potential foraging habitat and the potential for species occurrence.
American peregrine falcon *Falco peregrinus anatum*	**D**	Peregrines are found in many terrestrial biomes in the Americas; none seems to be preferred (although perhaps greater densities in tundras and coastally). The most commonly occupied habitats contain cliffs, for nesting and generally open landscapes for foraging (Hayes and Buchanan 2002; Hays and Milner 2004)). A source of water, such as a river, lake, marsh or marine waters is typically in close proximity to the nest site and likely is associated with an adequate prey base of small to medium sized birds (Johnsgard 1990). There is no historical data for peregrines in the LJCRP area. Potential nest sites have been identified but suitable nest ledges are limited as are larger bodies of water for prey concentrations.
Black swift *Cypseloides niger*	**N**	Black swifts nest on ledges or shallow caves in steep rock faces and canyons, usually near or behind waterfalls and typically inaccessible due to steep and vertical configuration (Levad et al. 2008). Black swifts breed in the Cascades of western Oregon, although only one definite breeding site has been identified (Marshall et al. 1996) and probably the Wallowa Mountains of northeastern Oregon (Gilligan et al. 1994).
Harlequin duck *Histrionicus histrionicus*	**N**	The harlequin duck uses clear, fast-flowing rivers and streams for breeding and is able to move swiftly and with great agility in turbulent white water, diving to river bottoms to pick larval insects from rocky substrates (Roberston and Goudie 1999). Cassirer et al. (1996) describes breeding streams as reaches on streams with average gradients between 1% and 7%, with some areas of shallow water (riffles); clear water; rocky, gravel to boulder-size substrate; and forested bank vegetation.
Bufflehead *Bucephala albeola*	**N**	The bufflehead nests near high mountain lakes surrounded by open woodlands. Buffleheads are cavity nesting ducks that are highly territorial (Gauthier and Smith 1987).
Black rosy finch *Leucosticte tephrocotis wallowa*	**N**	Black rosy finches as well as the Wallowa rosy finch generally breed in open, rocky areas above timberline, usually near snow fields or glaciers, talus, rockpiles, and cliffs (Johnson 2002, Macdougall-Shackleton et al. 2000). Nests are often found in rocky crevices located on cliffs (French 1959).
Columbian sharp-tailed grouse *Tympanuchus phasianellus columbianus*	**N**	Columbian sharp–tailed grouse habitat is characterized by bunchgrass and shrub/bunchgrass rangelands in good ecological condition with at least 20% of the landscape in tall, deciduous shrub thickets provided by riparian zones, mountain shrub patches, and aspen stands (Giesen and Connelly 1993, McArdle 1977, Saab and Marks 1992). A total of 12 releases have resulted in translocation of 368 grouse from southeastern Idaho and northeastern Utah to Wallowa County, Oregon, since 1991. Grouse dispersed from the initial release site (Clear Lake Ridge) to the Leap Area north of Enterprise, OR.
Upland sandpiper *Bartramia longicauda*	**N**	This species generally uses dry grasslands "with low to moderate forb cover, low woody cover, moderate grass cover, moderate to high litter cover, and little bare ground" (Dechant et al. 1999 (revised 2002)). The small and declining populations in mountain valleys and open uplands of NE Oregon (Union, Umatilla, Grant Cos.) are unusual because of altitude (1,035–1,585 m), use of sedge stands and of slightly elevated mounds in wet meadows, and location within 100 m of forest edge (Akenson 1991; Herman and Scoville 1988; Houston and Bowen 2001).
Greater sage grouse	**N**	Sage-grouse are considered a sagebrush obligate species as virtually all studies of sage-grouse have identified the bird's dependence on large,

Centrocercus urophasianus phaios		woody sagebrushes (Artemisia spp.) for food and cover during all periods of the year (Connelly et al. 2004; Connelly et al. 2000; Dalke et al. 1963).
Lewis' woodpecker *Melanerpes lewis*	**S**	Three main habitats used by Lewis' woodpecker throughout its range are burned or logged areas, open ponderosa pine savanna at high elevations, and riparian woodland dominated by large cottonwoods at low elevations (Abele et al. 2004; Bock 1970; Saab and Dudley 1998; Saab and Vierling 2001; Tobalske 1997). Currently there is very little recent post-fire habitat in the LJCRP area. Lewis woodpecker's have not been documented in the project area
White-headed woodpecker *Picoides albolarvatus*	**S**	The white-headed woodpecker is associated with open-canopied ponderosa pine forests (Bull et al. 1986; Frederick and Moore 1991; Garrett et al. 1996; Kozma 2011). White-headed woodpeckers forage predominantly on large-diameter live ponderosa pine trees (Dixon 1995a) with pine seeds being the most important vegetable food item in Oregon (Bull et al. 1986, Dixon 1995a). In addition, these woodpeckers may use areas which have undergone various silvicultural treatments, including post-fire areas, if large-diameter ponderosa pines (alive or dead) and other old-growth components remain (Frenzel 2002; Raphael 1981; Raphael et al. 1987; Raphael and White 1984; Wightman et al. 2010). Due to fire suppression in dry upland forest habitats, many areas that historically supported this species' habitat - open stands of large diameter ponderosa pine - now support closed canopied mixed species stands that no longer provide suitable habitat for the white-headed woodpecker.
MAMMALS		
Canada lynx *Felix lynx canadensis*	**N**	They are also found in isolated higher-elevation spruce, sub-alpine fir, and lodgepole pine forests in the western United States (Koehler and Brittell 1990; Ruediger et al. 2000). Habitat selection is associated with the habitat requirements of its primary prey, the snowshoe hare (Koehler and Aubry 1994). In general, mixed-conifer stands are often preferred by hares for cover with openings of shrubs for feeding. Lodgepole pine is often a major component of this habitat, especially within the early to mid-successional stages
North American wolverine *Gulo gulo luteus*	**N**	Similar to other large mammalian carnivores in the Rocky Mountains (e.g., Ursus arctos, Canis lupus), the current distribution of wolverines may be more determined by intensity of human settlement than by biophysical factors such as vegetation type or topography (Kelsall 1981, Banci 1994, Carroll et al. 2001). Natal dens are typically above or near treeline, require snow depths of 1-3 meters that persist into spring, and are in close proximity to rocky areas such as talus slopes or boulder fields (Copeland 1996).
Gray wolf *Canis lupus*	**D**	Habitat preference for the gray wolf appears to be more prey dependent than cover dependent. The wolf is a habitat generalist inhabiting a variety of plant communities, typically containing a mix of forested and open areas with a variety of topographic features (Mech et al. 1988; Mladenoff et al. 1999; Witmer et al. 1998). Based on data collected by the ODFW, the Imnaha pack (approximately 15 miles east of Joseph, Oregon) and Wenaha pack (centered approximately 20 miles west of Troy, Oregon) appear to be breeding, and in the summer of 2014 a new pack (Chesnimnus pack) was documented in the project area (Figure X). Wolves prey primarily on large ungulates such as elk and deer (Boyd et al. 1994; Fritts et al. 1994; Kunkel et al. 1999). Alternate prey typically consists of smaller mammals and birds, such as, beaver, ground squirrels, rabbits, and grouse (Boyd et al. 1994; Witmer et al. 1998). Individuals may take livestock as secondary prey when ungulates are less vulnerable or available (Witmer et al. 1998).

Fringed myotis *Myotis thysanodes*	**D**	Fringed Myotis (Myotis thysanodes) occurs from sea level to 2,850 m but is most common at middle elevations 1200 to 2,100 m. Although the fringed myotis is found in a wide variety of habitats including desert scrub, mesic coniferous forest, grassland, and sage-grass steppe its distribution is patchy and it appears to be most common in drier woodlands (oak, pinyon-juniper, ponderosa pine). They roost in crevices in buildings, underground mines, rocks, cliff faces, and bridges. Roosting in decadent trees and snags, particularly large ones, is common throughout its range in western U. S. and Canada. The fringed myotis has been identified in the Lower Joseph Creek Watershed (Anderson 1998). In general, the greatest threat to this species' habitat is human disturbance of roost sites through recreational caving and mine exploration, and disturbance of habitat (Weller 2005; Arizona Game and Fish Department 1993, Keinath 2004).
Townsend's big-eared bat *Corynorhinus townsendii*	**D**	Townsend's big-eared bats have been reported from sea level to 3,300 meters in a wide variety of habitat types including coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types (Piaggio and Sherman 2005; Kunz and Martin 1982). Distribution is strongly correlated with the availability of caves and cave-like roosting habitat, including abandoned mines (Sherwin et al 2000; Pierson et al 1999; Gruver and Keinath 2006). A survey by Anderson (1998) located this bat within the Lower Joseph Watershed.
Spotted bat *Euderma maculatum*	**S**	According Chambers and Herder (2005) the spotted bat has been found from below sea level to 2,700 m elevation and occurs from arid, low desert habitats to high elevation conifer forests. Prominent rock features appear to be a necessary feature for roosting. This species has been found in vegetation types that range from desert to sub-alpine meadows, including desert-scrub, pinyon-juniper woodland, ponderosa pine, mixed conifer forest, canyon bottoms, rims of cliffs, riparian areas, fields, and open pasture. Roost sites are cracks, crevices, and caves, usually high in fractured rock cliffs. As with most bat species, threats include habitat destruction or alteration, disturbance, sensitivity to pesticides and other pollutants, and overexploitation. No spotted bats have been recorded on the WWNF, however due to the lack of intensive bat sampling it is possible that the spotted bat occurs there.
INVERTEBRATES		
Johnson's hairstreak *Callophrys johnsoni*	**S**	These butterflies occur within coniferous forests which contain the mistletoes of the genus *Arceuthobium*, commonly referred to as dwarf mistletoe. These plants are highly specialized and are known to occur on a number of different conifers (Schmitt and Spiegel 2008). Old-growth and late successional second growth forests provide the best habitat for this butterfly, although younger forests where dwarf mistletoe is present also supports *C. johnsoni* populations (Larsen et al. 1995; Miller and Hammond 2007, LaBonte et al. 2001). Older coniferous forests, especially those with a heavy component of western hemlock (*Tsuga heterophyla*) that are infected by dwarf mistletoe (*Arceuthobium tsugense*) appear to be its key habitat (Andrews 2010a, Miller and Hammond 2007, Larsen et al. 1995). In Washington, it is only know to occur west of the Cascade crest (Larsen et al. 1995). A disjunct population occurs at the Oregon/Idaho border in Baker and Union counties, Oregon and Adams County, Idaho . This disjunct population may be a relict population isolated by climate changes (Davis et al. 2011).
Intermountain sulphur *Colia Christina pseudochristina*	**S**	This species inhabits open woodland from 3400 to 5000 feet, including meadows, roadsides, and open forest and is most often found on steep sunny slopes at the ecotone between forest and shrubsteppe or grassland habitats (Foltz 2009). Hammond (*In* Foltz 2009) describes the subspecies habitat as sagebrush with scattered Ponderosa Pine, including both south- and east-facing slopes. The larvae of this subspecies feed on *Lathyrus* species, including *L. brachycalix, L. lanzwertii, L. puciflorus,* and. *L. nevadensis* (Foltz 2009). The Asotin County population in Washington was reported to feed on *L. puciflorus* (*reviewed in* Warren 2005). Adults of *C. christina* use a variety of plants as nectar sources, and males may occasionally be seen frequenting mud puddles (Warren 2005).

Silver-bordered fritillary *Boloria selene*	**N**	The silver-bordered fritillary inhabits open, boggy, wet meadows (Miller and Hammond 2007) and true bogs which support violets (*Viola* spp.) usually located within low- to mid-elevation forests (Larsen et al. 1995). Open riparian areas and marshes containing a large amount of Salix and larval food plants also provide habitat (Warren 2005). Caterpillar host plants consist of violets, including pioneer violet (*Viola glabella*) and northern bog violet *V. nephrophylla*, (Pyle 2002). Adult nectar plants are composite flowers including goldenrod (*Solidago* spp.) and black-eyed Susan (*Rudbeckia* spp.).
Western bumblebee *Bombus occidentalis*	**S**	Suitable habitat includes typically associated with sub-alpine meadows, coastlines, and high elevation valleys. It is known to feed on sweet clover, rabbit brush, thistle, buckwheat and clover (Koch et al 2011).
Yuma skipper *Ochlodes yuma*	**N**	*O. yuma* is found around reed beds in and around freshwater marshes, streams, oases, ponds, seeps, sloughs, springs, and canals (Larsen et al. 1995, Opler, et al. 2013). Adults are almost always found in close association with the primary larval host plant *Phragmites australis* (common reed).

Table TE_effects. Proposed Endangered, Threatened or Sensitive species known or suspected to occur on the Wallowa-Whitman NF and effects by Alt.

Species	Habitat within planning area	Alt 1	Alt 2	Alt 3	Rationale
AMPHIBIANS					
Rocky Mt tailed frog *Ascaphus montanus*	**D**	NI	NI	NI	Habitat protected by RHCAs
Columbia spotted frog *Rana luteiventris*	**S**	NI	MIIH -	NI	Habitat protected by RHCAs Swamp ck
BIRDS					
Northern bald eagle *Haliaeetus leucocephalus*	**S**	NI	NI	NI	Habitat requirements not affected.
American peregrine falcon *Falco peregrinus anatum*	**D**	NI	NI	NI	Habitat requirements not affected.
Black swift *Cypseloides niger*	**N**	-	-	-	No potential habitat
Harlequin duck *Histrionicus histrionicus*	**N**	-	-	-	No potential habitat
Black rosy finch *Leucosticte tephrocotis wallowa*	**N**	-	-	-	No potential habitat
Columbian sharp-tailed grouse *Tympanuchus phasianellus columbianus*	**N**				No potential habitat
Upland sandpiper *Bartramia longicauda*	**N**	-	-	-	No potential habitat
Greater sage grouse *Centrocercus urophasianus phaios*	**N**	-	-	-	No potential habitat
Lewis' woodpecker *Melanerpes lewis*	**S**	NI	BI	BI	Trend toward restoring habitat under

					Alt.'s 2,3
White-headed woodpecker *Picoides albolarvatus*	**S**	NI	BI	BI	Trend toward restoring habitat under Alt.'s 2,3
MAMMALS					
Canada lynx *Felix lynx canadensis*	**N**	NE	NE	NE	Highly unlikely to occur in this area
North American wolverine *Gulo gulo luteus*	**N**	-	-	-	No potential habitat
Gray wolf *Canis lupus*	**D**	NI	NI	NI	No known den sites within area
Fringed myotis *Myotis thysanodes*	**D**	NI	MIIH	MIIH	Roost tree abundance potentially affected
Townsend’s big-eared bat *Corynorhinus townsendii*	**D**	NI	NI	NI	Habitat requirements not affected.
Spotted bat *Euderma maculatum*	**S**	NI	NI	NI	Habitat requirements not affected.
INVERTEBRATES					
Johnson’s hairstreak *Callophrys johnsoni*	**S**	NI	MIIH	MIIH	Removal of mistietoe may impact habitat
Intermountain sulphur *Colia Christina pseudochristina*	**S**	NI	MIIH	MIIH	Prescribed fire may impact habitat
Silver-bordered fritillary *Boloria selene*	**N**	-	-	-	No potential habitat
Western bumblebee *Bombus occidentalis*	**S**	NI	MIIH	MIIH	Prescribed fire may impact habitat
Yuma skipper *Ochlodes yuma*	**N**	-	-	-	No potential habitat

Status: T = Threatened; E = Endangered; C = Federal Candidate;S = Region 6 Sensitive.
Habitat: D= Documented; S = Suspected habitat; H = historic habitat; N = No habitat

Listed species: NE = No Effect, LAA = May Affect-Likely to Adversely Affect, NLAA = May Affect – Not Likely to Adversely Affect, BE = Beneficial Effect

Sensitive species: NI = No Impact, MIIH = May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species, WIFV = Will Impact Individuals or Habitat with a consequence that the action may contribute to a trend towards federal listing or cause a loss of viability to the population or species, BI = Beneficial Impact

FEDERALLY LISTED SPECIES

CANADA LYNX (*Felix lynx canadensis*)

Lynx occur in coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare (Ruediger et al. 2000). They are typically associated with large contiguous tracts of boreal or coniferous forest in Alaska and Canada, but are also found in high elevation spruce, subalpine fir, and lodgepole pine forests in the western United States. Vegetation that constitutes primary lynx habitat is subalpine fir where lodgepole pine is a major seral species, generally between 1,250-2,000 meters. Cool, moist Douglas-fir, grand fir, western larch, and aspen forests may also contribute to lynx habitat when interspersed with subalpine forests. Dry forest types (ponderosa pine, climax lodgepole pine) are not considered habitat. Hares, their primary prey, exploit early to mid-successional stages and lynx foraging habitat is mixed confier stands characterized by a dense, multi-layered understory that maximizes hare browse at both ground level and at varying snow depths. Lynx prefer to move through continuous forest and frequently use ridges, saddles, and riparian areas. They commonly select mature forest with dense patches of downed trees for denning (Johnson and O'Neil 2001).

The Blue Mountains represent the southern extent of lynx distribution, which would explain the rarity of this species on the periphery of its range both historically and presently (Brittell et al. 1989). Based on limited verified records, lack of evidence of reproduction, and occurrences in atypical habitat that correspond with cyclic highs in Canada, lynx are through to occur in Oregon as dispersers that have never maintained resident populations. They are considered an infrequent and casual visitor by the State of Oregon (Ruediger et al. 2000). Lynx habitat in northeastern Oregon is categorized as a "peripheral area" meaning there is no evidence of long term presence, or reproduction that might indicate colonization or sustained use by lynx, but habitat may enable the successful dispersal of lynx between populations or subpopulations (Wallowa-Whitman National Forest Lynx Strategy Letter April 19,2007). The Forest conducted extensive winter track surveys for wolverine and lynx from 1991 – 1994 and 2 sets of possible lynx tracks were found on the Whitman Ranger District (Wolverine and Lynx Winter Snow Track Reports, 1991-92, 1992-93, 1993-94, Wallow-Whitman NF). One set was found during 1992-93 near the town of Bourne and the other set was found during 1993-94 near Gorham Butte. None of the hair collected from hair snares used for the National Forest Lynx Survey conducted on the Forest from 1999-2001 was identified as lynx. The Forest is considered "unoccupied" habitat; "occupied" habitat is defined as requiring at least 2 verified observations or records since 1999, or evidence of lynx reproduction (Wallowa-Whitman National Forest Lynx Strategy Letter April 19, 2007).

EFFECTS ANALYSIS

Alternative 1, 2, and 3 (Discussion of these alternatives is combined because the effects would be similar)- Any of the alternatives of this project would have **No Effect (NE)** to the Canada lynx because it is not considered present on the Forest (Wallowa-Whitman National Forest Lynx Strategy Letter April 19, 2007).

SENSITIVE SPECIES

Existing Condition of Populations and Habitat and Environmental Consequences

ROCKY MOUNTAIN TAILED FROG (*Ascaphus montanus*)

Rocky Mountain Tailed Frogs (Ascaphus montanus) are primarily nocturnal, and live in fast-flowing headwater streams in old-growth forests (Nielson et al, 2001). They occur in very cold, fast-flowing streams that contain large cobble or boulder substrates, little silt, and are often darkly shaded (Bull and Carter 1996).. Within a watershed, distribution is largely restricted to the headwaters or areas of cold water and coarse substrate (Jones et al. 2005).

Concern over the tailed frog arose in the early 90's when it was found that its populations had declined in the Pacific Northwest, primarily because of timber harvesting (Corn and Bury 1989). Bull 1996 found that the variables that best predicted tailed frog abundance was the percentage of a 2000-m stretch of stream containing a buffer, the percentage of boulders and cobble in the stream and the slope.

Inland tailed frogs are a USDA Forest Service Region 6 sensitive species and were documented in Broady, West Fork Broady, East Fork Broady and Cottonwood Creeks during Forest Service's stream surveys in the 1990s (Table 1).

Other streams that may provide habitat for tailed frogs are Peavine Creek, Rush Creek, Horse Creek, Deadhorse Creek and the Cottonwood tributary south of Deadhorse Creek. Tailed frogs are likely to occur in RHCA category 1-3's due to the species need for flowing water at all times. Tailed frogs are not likely to occur in Swamp Creek where timber harvest is prescribed in part of the RHCA, as they are found in fast flowing, cold headwater streams.

Table 1. Observations of Inland Tailed Frog During Stream Surveys

Observations of Inland Tailed Frog During Stream Surveys

Stream Name	Date	T/R/Sec	Comments
Broady Creek	8/11/1992	T05N/R46E/Sec 33	Tailed frog larvae; Confluence of Broady and E.F. Broady creeks
Cottonwood Creek	8/17/1994	T04N/R47E/Sec8	Tailed frog larvae
	8/18/1994	T04N/R47E/Sec8	Adult tailed frog sighted up Trib 11
	8/23/1994	T04N/R47E/Sec16	Tailed Frog (adult and Larvae) in W.F. Cottonwood
E.F. Broady Creek	6/17/1997	T05N/R46E/Sec33	Tailed frogs observed
W.F. Broady Creek	8/04/1994	T05N/R46E/Sec32	Adult and larval tailed frog observed

<u>Mitigation Measures</u>

Wild – 33

To prevent spread of diseases to amphibians including Columbia spotted frog and Rock Mountain tailed frog, gear, hoses and dipping buckets used to transport or move water from streams, rivers, or ponds needs to be disinfected by drying in the sun (must be completely dry inside and out) or washing with a chemical disinfectant before changing to a different water source.

EFFECTS ANALYSIS

Alternatives 1, 2, and 3 (Discussion of these alternatives is combined because the effects would be similar)- The no action alternative would not change the stream morphology where tailed frogs occur. Alternative 2 and Alternative 3 will preserve riparian habitat with a corresponding Riparian Habitat Conservation Area (Category 1,3) no activity buffers (see specifics in Chapter 2 of the Lower Joseph Environmental Assessment). These RHCA's will preserve the canopy cover, flow and woody debris within and around occupied streams. Therefore all alternatives will have **No Impact (NI)** on the tailed frog.

COLUMBIA SPOTTED FROG (*Rana luteiventris*)

Columbia spotted frogs are highly dependent on aquatic habitats and require permanent and semi-permanent wetlands that have aquatic vegetation and some deeper or flowing water for overwintering (Bull and Marx 2002, Pilliod et al., 2002). The spotted frog frequents waters and associated vegetated (grassy) shorelines of ponds, springs, marshes, and slow-flowing streams and appears to prefer waters with a bottom layer of dead and decaying vegetation (Bull 2005). They occur along the grass and sedge margins of streams, lakes, ponds, springs, and marshes. The Columbia spotted frog exhibits strong fidelity to breeding sites and often deposits eggs in the same locations in successive years (Reaser 2000, Engle 2001, Pilliod et al. 2002). They deposit egg masses in still, shallow waters atop submergent herbaceous vegetation or among clumps of herbaceous wetland plants. After breeding, adults often disperse into adjacent wetland, riverine and lacustrine habitats. Tadpoles live in the warmest parts of ponds (Corkran and Thoms 2006). Froglets and adults live in well-vegetated ponds, marshes or slow, weedy streams that meander through meadows (Corkran and Thoms 2006). Wintering habitat was described as large (~2 ha), deep (>3 m) ponds and lakes (Bull and Hayes 2002, Pilliod et al. 2002). Springs may be used as over-wintering sites for local populations of spotted frogs (Bull and Hayes 2002).

Columbia spotted frogs are year-round residents of the Blue Mountains and occur in a number of locations across Northeast Oregon (Bull 2005; Reaser and Pilliod 2005).

A variety of threats to the persistence of populations of Columbia spotted frogs have been identified, including wetland loss, introduced predators, mining, grazing, development, and diseases (USFWS 1997, Monello and Wright 1999, Reaser and Pilliod 2005, Pearl et al. 2007, Tait 2007). The introduction of non-native predators such as bullfrogs (Marshall et al. 1996), bass and predatory freshwater fish species are believed to contribute to their decline (Pilliod and Petersen 2001, Tait 2007, Murphy et al. 2010). However, Bull and Marx (2002) did not find a strong relationship between the presence of introduced trout and the abundance of eggs and larvae of Columbia spotted frogs. More recently, Pilliod et al. (2010) found no relationship between fish presence and occupancy at any scale by Columbia spotted frogs.

Livestock have been observed to cause direct injury or mortality by trampling spotted frogs and eggs and to impact spotted frog movement by defoliating and dewatering migration corridors and collapsing banks along ponds or rivers used for overwintering sites (Engle 2001, Bull 2005). In Nevada, Reaser (2000) suggested that livestock grazing was important in limiting distribution and density of spotted frogs, but her inferences were correlative and not a controlled study (Tait 2007). Bull and Hayes (2000) and Adams et al. (2009) reported that they did not find any differences in productivity of spotted frogs at grazed vs. ungrazed sites in northeast Oregon. However, there was an indication that grazed sites in this area had reduced food abundance (Whitaker et al. 1983, Bull 2003). In some situations, some amount of grazing may be beneficial to spotted frog habitat. By reducing the density of bank vegetation, grazing could allow increased solar input, raising water temperatures that would benefit egg and larval development and providing basking sites for adults (Bull 2005). The magnitude and nature of the influence of livestock grazing on the Columbia spotted frog has not yet been determined (Tait 2007).

Increasing densities of roads was expected to result in reductions of habitat quality for Columbia spotted frogs as a result of direct mortality, habitat fragmentation, and reduced water quality (Findlay and Houlahan 1997, Findlay and Bourdages 2000, Funk et al. 2005, Houlahan and Findlay 2003, Trombulak and Frissell 2000, Vos and Chardon 1998). Habitat fragmentation and associated reduction in connectivity of habitat has been associated with the disappearance of frog populations from occupied habitat (Knapp et al. 2003, Cushman 2006). Columbia spotted frogs have been reported to move from 500 m (Turner 1960, Hollenbeck 1974, Bull and Hayes 2001) to 1 km (Pilliod et al. 2002) between ponds.

There have been no surveys specifically for spotted frogs within the watershed but habitat is available and the species may exist along the perennial low gradient streams or ponds in the upper elevations.

<u>Mitigation Measures</u>

- *To prevent spread of diseases to amphibians including Columbia spotted frog and Rock Mountain tailed frog, gear, hoses and dipping buckets used to transport or move water from streams, rivers, or ponds needs to be disinfected by drying in the sun (must be completely dry inside and out) or washing with a chemical disinfectant before changing to a different water source*

Effects Analysis

Alternatives 1 and 3 (Discussion of these alternatives is combined because the effects would be similar)- The no action alternative and alternative 3 would not change the stream morphology where spotted frogs may occur as no proposed treatment is proposed within any RHCA. RHCA no harvest buffers (category 1-3) will preserve the canopy cover, flow and woody debris within and around occupied streams. Therefore for these 2 alternatives there will be **No Impact (NI)** on the Columbia spotted frog.

Alternative 2 proposes vegetation treatment of 31 acres along Swamp Ck, a category 1 RHCA. T **Individuals or Habitat (MIIH)** but are not expected to lead to a population decline of the species. Best management practices would be in place. Habitat protected by RHCAs except in Swamp Ck meadow restoration, a 25' no-cut buffer along with best management practices will protect potential habitat.

Treatment within the category 1 RHCA along Swamp Ck. has the potential to occur within habitat for Columbia spotted frogs though effects will likely be minimal as best management practices and other design criteria (Appendix J) are in place to protect riparian habitats. The 25' not cut buffer will largely provide complete protection to this aquatic species generally found very close to perennial streams/ponds.

NORTHERN BALD EAGLE (*Haliaeetus leucophalus*)

Bald eagles inhabit forested areas primarily near larger bodies of water including lakes and rivers (Peterson 1986). Eagles are protected by the 1940 Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the Endangered Species Act of 1973 as amended.

Bald eagles prefer to nest in large dominant trees where they build their nests on large branches or forks of trees (Peterson 1986). Most nest trees are located close to water. Eagles prefer to nest in mature or old growth trees with an average height of about 100 feet. Many times these birds will also have one or more alternate nests (Bent 1937). Perch trees and sites adjacent to the nest tree are also important since the adult male may spend much of his daytime hours perched. Bald eagles utilize a wide range of food items ranging from fish, small mammals and waterfowl, to available carrion. Several studies have indicated the staple of their diet is fish (Peterson 1986, Rees 1990) and can comprise as much as 70-90 percent of their diet.

Occasional bald eagle sightings might be reported during the winter, but it is rare at the higher elevations of this project area. There is no history of eagles nesting in the Lower Joseph project area and no large bodies of water that bald eagles require within the project area.

EFFECTS ANALYSIS

Alternatives 1, 2, and 3 (Discussion of these alternatives is combined because the effects would be similar)- The Lower Joseph project area may contain some incidental roosting habitat for bald eagles but does not contain nesting habitat. None of the alternatives would alter this habitat enough to make it unsuitable for bald eagles; therefore this project will have **No Impact (NI)** on bald eagles or their habitat.

PEREGRINE FALCON (*Falco peregrinus anatum*)

Peregrine falcons usually inhabit open country where there are rocky cliffs with ledges overlooking river, lakes or forests with an abundance of birds. Their primary prey is small-medium birds which are usually captured in flight. They also feed on mammals, insects and sometimes fish. They prefer to nest almost exclusively on cliffs and tend to be near water bodies. Nest sites in trees, on sand dunes, cutbanks, and mounds are rare. Man-made structures are occasionally used. Sheer cliffs that are high and prominent are most often used and usually contain a small cave or ledge overhang large enough to contain nesting. The nest is a simple scrape with no added material.

The peregrine was listed as endangered in 1970 under the Endangered Species Conservation Act Peregrine populations were at their lowest in the 1960's and early 1970's when Peregrines were eliminated from the eastern US and across the Midwest, and reduced to a few hundred pairs at most in the western United States and Mexico.. Due to a ban on the use of DDT and other chlorinated hydrocarbons, and to successful captive breeding, rearing and release of over 6,000 Peregrines, there are now over 2,000 pairs breeding each year across the United States. The peregrine was removed from the FWS List of Threatened and Endangered Species in August of 1999 (U.S. Fish and Wildlife, 2003).

Currently, the greatest management concern for peregrine falcons within the forest is human activity during the nesting period. The presence of a person above the nest cliff can cause nest abandonment, or mortality of eggs or young from chilling, overheating, accidental damage or expulsion, or predation

Peregrine falcons have been sighted within the watershed. Potential nest sites have been identified but suitable nest ledges are limited as are larger bodies of water for prey concentrations. There is no historical data for peregrines nesting in the watershed. Though no longer listed as endangered, their numbers are still low and continuing to adhere to the recovery goals is warranted.

If nesting is documented during project implementation mitigation actions will be taken. Human activities will be restricted during the breeding season (Feb 1- August 15) or until peregrine activity ceases at the site. All timber management activities will be conducted outside of the breeding with the potential exception of fire and medical emergencies.

EFFECTS ANALYSIS

Alternatives 1, 2, and 3 (Discussion of these alternatives is combined because the effects would be similar)- The Lower Joseph project area may contain potential nesting habitat and some incidental foraging habitat for peregrine falcons but nesting has not been documented. None of the alternatives would alter this habitat enough to make it unsuitable for peregrine falcons; therefore this project will have **No Impact (NI)** on peregrine falcons or their habitat. If a nest is found to be active prior to/during timber activities taking place, those activities will only take place outside of the breeding season and human activities will be restricted

LEWIS WOODPECKER (*Melanerpes lewis*)

This uncommon bird is a primary cavity nester and is listed as sensitive. Three main habitats used by Lewis' woodpecker throughout its range are burned or logged areas, open ponderosa pine savanna at high elevations, and riparian woodland dominated by large cottonwoods at low elevations (Abele et al. 2004; Bock 1970; Saab and Dudley 1998; Saab and Vierling 2001; Tobalske 1997). Suitability of burned areas as habitat for Lewis's woodpeckers may vary with size of burn, time since burn, intensity of burn, and geographic region (Tobalske 1997, Saab and Dudley 1998, Saab and Vierling 2001, Russell et al. 2007).

Studies suggest that optimal canopy closure for nest sites is <= 30% (Linder and Anderson 1998; Sousa 1983). Some studies have suggested that Lewis's woodpeckers require a shrubby understory (e.g., Bock 1970; Sousa 1983), while others have shown that preferred habitat included a relatively sparse (<18% canopy cover) shrub layer (Block and Brennan 1987; Linder and Anderson 1998).

Unlike other woodpeckers, Lewis's woodpecker is not morphologically well-adapted to excavate cavities in hard wood (Spring 1965). Lewis's woodpeckers tend to nest in a natural cavity, re-use pre-existing cavities, or may excavate a new cavity in a soft snag (Harrison 1979; Raphael and White 1984; Saab and Dudley 1998; Tobalske 1997). The diet is mostly insects in spring and summer, with berries and seeds important in the fall.

On partially-logged burns with high nesting densities in Idaho, nest sites were characterized by the presence of large, soft snags and an average of 25 snags > 9 inches DBH per acre (Saab and Dudley 1998). Haggard and Gaines (2001) in northeast Washington found Lewis’s woodpeckers in post fire habitat were more abundant in areas with <5 snags (>=9 inches DBH) per acre and were not found in areas with >=15 snags per acre following salvage logging of the burn. Saab et al. (2009) also found Lewis’s woodpecker’s nests sites were primarily associated with partially logged burns.

The Lewis’s woodpecker is present on the District; however, no sightings of this species have occurred in the analysis area. Habitat for the Lewis’ woodpecker is uncommon in the Lower Joseph analysis area. No surveys within the project area have been specifically conducted for the Lewis woodpecker. In surveys (2014) aimed at identifying goshawk and pileated occupancy, the Lewis’ woodpecker has not been observed in this area.

There is little recent post-fire habitat, which provide source habitat for this species in the planning area. The last wild-fire that burned substantial area occurred in 2012 was the Cache Ck, fire. Approximately 5,777 acres of this fire perimeter are within the Lower Joseph project area.

Cottonwood willow habitat near riparian habitat is uncommon in the Lower Joseph project area. Due to fire suppression and past timber management in dry upland forest habitats, many areas that historically supported open stands of large diameter ponderosa pine now support closed canopied mixed ponderosa pine, Douglas-fir, grand fir, and larch stands; they no longer provide suitable habitat for the Lewis’s woodpecker. The HRV for xeric pine, large tree, open canopied forests which is considered one of the source habitats for this species, is about 25%-71%. The current amount of this habitat type is about 6%, well below the HRV.

Vegetation treatments may produce source habitat as the species is associated with large tree -open-canopied xeric-pine habitats. Although snags are not proposed for harvest, some snags will be lost due to safety and logging systems.

Lewis's Woodpecker Habitat						Range of Variation		
PVG	Tree Size	Canopy Closure	% Existing	%A2	%A3	Low (%)	Average (%)	High (%)
Xeric Pine	>=20"	open	7	14	13.0	25.0	48.1	71.1

Decreases in road density with Alternative 2 may decrease loss of snags due to wood cutting and hazard tree removal. Bate et al. (2007), found that snag numbers were lower adjacent to roads due to safety considerations, firewood cutters, and other management activities. Other literature has also found reduced snag abundance along roads (Wisdom and Bate 2008).

Effects Analysis –

Alternative 1 (No Action) - Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. This resulting post wildfire habitat may provide suitable habitat for this species. Wildfire would likely produce snags, and Lewis’s woodpeckers are associated with recent post-fire habitat that has large pine snags (Saab and Dudley 1998). The impact to habitat would depend on the size and severity of the disturbance. Closure/decommissioning of approximately 53 miles from existing condition will likely benefit this species.

Alternatives 2 and 3. (Discussion of these alternatives is combined because the effects would be similar) Vegetation management activites that reduce canopy cover in the xeric pine, will increase habitat for these species. Riparian habitat and corresponding Riparian Habitat Conservation Area no activity buffers (see specifics in Chapter 2, category 1-3 streams) will be conserved within the Lower Joseph project area, only with the exception of 31 acres treated along Swamp Ck. The treatments prescribed in this meadow area are to restore the natural floodplain and natural vegetation, trees >= 21" dbh will not be removed and likely these prescriptions will improve the quality of potential habitat in the area.

Vegetation treatments to increase the abundance of large-tree open canopied pine in the xeric pine pvg will benefit this species though the increase is minimal (<100 acres) as the overall abundance of this pvg is limited in this project area.

Alternative 2 implements closure/decommissioning of approximately 70 miles from existing condition will benefit this species. Road closures proposed in Alternative 3 are minimal and will not benefit this species.

Although snag densities may be reduced, the increase in source habitat following vegetation treatments, Alternatives 2 and 3 would have a **Beneficial Impact (BI)** on the Lewis' woodpecker with Alternative 2 likely having a greater benefit than Alternative 3 due to the increase in road closures.

WHITE-HEADED WOODPECKER (*Picoides albolarvatus)*

This woodpecker is closely associated with open ponderosa pine or mixed-conifer dominated by ponderosa pine (Csuti et al. 1997, Marshall et al. 2003). Although most abundant in uncut old-growth forest stands, white-headed woodpeckers will use areas where silvicultural treatments provide sufficient densities of large-diameter ponderosa pines. It requires large trees for foraging and snags for nesting (Csuti et al. 1997). It is the only woodpecker that relies heavily on ponderosa pine seeds for food.

This species excavates its nest cavities in moderately decayed wood, usually in large-diameter snags (Raphael and White 1984, Milne and Hejl 1989, Dixon 1995, and Dixon 1995a). They are dependent on large pine seeds as food during non-breeding season and almost all ponderosa pine seed production is by large, dominant trees in open situations (Oliver and Ryker 1990).

Frenzel (2002) found that of 405 nests of white-headed woodpeckers, all but 12 were in completely dead trees. Dixon (1995a, 1995) found population density increased with increasing volumes of old-growth ponderosa pine in both contiguous and fragmented sites. In addition, these woodpeckers may use areas which have undergone various silvicultural treatments, including post-fire areas, if large-diameter ponderosa pines (alive or dead) and other old-growth components remain (Frenzel 2002; Raphael 1981; Raphael et al. 1987; Raphael and White 1984; Wightman et al. 2010). Average canopy closure at 55 nest sites studied by Frenzel (2002) was 13%. Understory vegetation is generally sparse within preferred habitat (Garrett et al 1996). Frenzel (2004) found that shrub cover was a significant variable in predicting nest success. Nest sites with <5% shrub cover had the highest mean nesting success of 61%. Nest success with shrub cover >5%, had a mean nest success of 42%.

Past, present, and ongoing habitat loss pose a threat to the continued existence of this species throughout its range (Wisdom et al 2000). The loss has occurred mainly through a combination of timber harvest, road building, wildfire and fire suppression. Habitat quality has been reduced due to extensive loss of large ponderosa pine trees primarily from historic timber harvesting. Fire suppression has allowed understory encroachment of firs and increased fuel loads which predispose these areas to stand-replacement fires and lack of recruitment of young ponderosa pine.

There has been a loss of snags and down logs (foraging) from timber harvest and fuelwood cutting. Bate et al. (2007) and Wisdom and Bate (2008), found that snag numbers were lower adjacent to roads due to safety considerations, firewood cutters, and other management activities indicating that roads are an indirect threat to snag abundance.

There are no known records of white-headed woodpeckers in the project area, however, in surveys (2014) aimed at identifying goshawk and pileated occupancy, one possible verbal response was heard within the project area. Habitat for white-headed woodpeckers does exist though it is underrepresented.

On the Wallowa-Whitman NF, Wales et al (2011) found that the HRV for white-headed woodpeckers in potential habitat was 30-76% (as a mean across all watersheds on the Forest). Currently in the LJ project area white-headed woodpecker habitat is at about 2% of the RV.

<u>Mitigation Measures</u>

- Wild – 26 - To conserve nesting habitat of raptors or pileated woodpecker, consult the wildlife biologist to establish a nest zone buffer around any new, or existing, nests discovered prior to or during project layout and implementation and, if appropriate, to restrict activities within the nest area during occupancy, according to requirements of the species involved.
- *See other project design criteria for protection measures of large trees and snags*

EFFECTS ANALYSIS

Alternative 1 (No Action) - Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. This resulting post wildfire habitat may provide suitable habitat for this species. Wildfire would likely produce snags, and white-headed woodpeckers are known to occur in recent post-fire habitat that has large pine snags (Wightman et al. 2010). The impact to habitat would depend on the size and severity of the disturbance. Closure/decommissioning of approximately 53 miles from existing condition will likely benefit this species. Overall, due to the low abundance of habitat for this species, there is overall **Beneficial impact** to the white-headed woodpecker or their habitat under Alternative 1.

	Alt. 1	Alt. 2	Alt 3
Source Habitat (acres)	898	5,771	4,257
% HRV	2%	13%	9%

Alternatives 2 and 3 – Vegetation treatments prescribed in both action alternatives, will increase source habitat for white-headed woodpeckers. The proposed treatments (removing small trees, retaining big trees, underburning) for these alternatives would move the project area toward open stands of mature ponderosa pine and Douglas-fir that are characteristic of habitat for white-headed woodpeckers.

Alternatives 2 and 3 propose approximately 12,000 acre and 9,000 acres of commercial harvest in Dry Forests. Source habitat following treatment will potentially increase from 713 to 4,771 acres in Alt. 2, and 4,257 acres in Alt. 3. Large snag density will likely be reduced in and adjacent to harvest units due to safety and logging logistics though mitigation measures are in place to minimize this.

Prescribed burning has the potential to consume existing snags and logs, but burn prescriptions would maximize retention. Burning would occur when fuel moistures are high, fuel pull-back of needles, bark accumulations would be implemented from around live trees and snags ≥20 in dbh where necessary to minimize loss, and appropriate ignition patterns would be used to minimize losses (no snags or large logs would be used as an ignition source) (*see mitigation measures*). Prescribed burning would also likely create new snags to replace some of the material that might burn. New snags created from the burning would partially mitigate the loss of snags, but burning would likely replace some higher quality, softer snags with lower quality, harder snags without heartrot. Newly created snags are usually hard and not easily excavated. After about 3 years, the newly created low quality hard snags would begin to turn soft and become available for nesting and foraging. Endemic levels of insects and disease would be retained. Insect activity and disease presence would remain at normal functional levels, creating individual snags or small pockets of dead trees.

Treatments would begin to restore Dry – Large tree – open-canopied forests and increase the long term trend to return to historic proportions. Tree densities after treatment would more closely reflect historical conditions. Existing large trees and dead wood would be retained and protected (*see mitigation measures Wild 1-13*). All Ponderosa pine and Western larch trees >21 inches dbh and snags ≥9 inches dbh would be retained unless they presented a safety hazard. Pre-activity down logs would be retained according to LRMP Amendment #2 standards (U.S. Forest Service 1995). Logs would be left in current lengths and not cut into pieces.

Implementation of Alternative 2 would also reduce open road densities by about 70 miles as compared to existing condition. Reduced open road densities will increase the potential for increased snag abundance and development. Alternative 3 has minimal change from existing condition on abundance of open roads.

Although snag densities may be reduced, the large increase in source habitat following vegetation treatments, Alternatives 2 and 3 would have a **Beneficial Impact (BI)** on the white headed woodpecker.

Cumulative effects

A focal species assessment model was developed for white-headed woodpeckers and used to analyze habitat across each of the national forests (Wales et al. 2011). Source habitat for both current and historical conditions was considered to be the dry forest PVG with single and multi-stories, large-tree structure, > 20 inches DBH, and open canopies (i.e., < 40 percent).Other factors that were considered in the evaluation of habitat for this species included snag, open motor vehicle route density and shrub cover.

The viability outcome for the white-headed woodpecker historically was projected to be an A, while currently on all three national forests the viability outcome is projected to be an E. This results in a high level of concern for the viability of the white-headed woodpecker the Walllowa-Whitman NF. The main factor leading to this level of concern is the historic loss of large, open canopied ponderosa pine habitat resulting in levels far below HRV for these habitats.

GRAY WOLF *(Canis lupis)*

Considered a habitat generalist, gray wolves occupy a wide range of habitats where there's an adequate prey base and human interference is low (Mladenoff et al. 1995). Historically, they occupied grasslands, sagebrush steppe, coniferous and mixed forest and alpine areas. Wolves prefer fairly large tracts of roadless country containing a mix of forested and open areas with a variety of topographic features (Witmer et al. 1998). The Northern Rocky Mountain Wolf Recovery Plan consider the key components of wolf habitat to be 1) a sufficient, year-round prey base of ungulates (big game) and alternative prey, 2) suitable and somewhat secluded denning and rendezvous sites and 3) sufficient space with minimal exposure to humans (U.S. Fish and Wildlife Service 1987). The size of wolf home ranges vary greatly across and among different regions, with ranges being reported at 94 km^2 in Minnesota and 13 km^2 in Alaska (Mech 1970) respectfully, and size and location are determined primarily by prey base (Witmer et al. 1998). Wolves have been shown to avoid densely roaded areas (Thurber et al. 1994) and areas with high human population density (Fuller et al. 1992, Mladenoff et al. 1995). Human caused mortality may be the largest limiting factor in the recovery of wolf populations across their range (Mech 1989, Pletscher et al. 1997).

Wolves were extirpated from Oregon by the mid-19th century, with the last paid bounty occurring in 1946 (Marshal et al. 1996), and are currently listed as endangered on both the federal and Oregon state endangered species lists. Wolves in the northern Rocky Mountains (Oregon, Idaho, Montana, Wyoming, eastern Washington, and northern Utah) have continued to increase annually since the initial reintroductions took place in 1995.

Currently there are 10 known wolf packs in northeastern Oregon that are currently being monitored by the Oregon Department of Fish and Wildlife (see Figure wlf below). The Imnaha pack (approximately 15 miles east of Joseph, Oregon) was first confirmed as breeding in 2009. The Wenaha pack is centered approximately 20 miles west of Troy, Oregon and has been known to use the western part of the Lower Joseph project area. During the summer of 2014 a wolf pack was documented within the Lower Joseph project area

Primary management concerns for the WWNF are 1) disturbance to denning wolves or rendezvous sites when pack numbers are low, and 2) providing adequate habitat for populations of prey species such as elk.

EFFECTS ANALYSIS

If a den or rendezvous site is identified prior to or during project activities, the Forest Service would enter dialog with ODFW to address ways of reducing potentially disturbing activities near the sites. All Alternatives meets the Forest Plan (1990) Threatened, Endangeredand Sensitive species Standard and Guideline 1 and HCNRA CMP (2003) WLD S2 for Gray Wolves.

Alternatives 1, 2, and 3 (Discussion of these alternatives is combined because the effects would be similar)- There is no documented denning or rendezvous sites on or in the immediate vicinity of the project area. Effects of the proposed project should have no direct negative impacts on wolves, wolf habitat, or potential habitat. There would be few effects to the gray wolf from this project because: 1) no denning or rendezvous sites have been identified within the project area, and 2) prey species will not be negatively affected by proposed actions. It is likely that through the proposed vegetation treatments (Alternatives 2 and 3), and decreased miles of open roads (Alternative 1 and 2), the quality of habitat for elk will increase. Increased quality of habitat for elk may in benefit elk due to increased availability of prey. Reduced mile of open roads on Forest Service land proposed in Alternatives 1 and 2 may help to keep elk and therefore wolves, on Forest service lands. Therefore it can be determined that the proposed project would have **No Effect (NE)** to the gray wolf.

Cumulative Effects

All alternatives: The only activity with potential cumulative impacts to wolves is reducing road densities (Alternative 2). Reduced road densities may help distribute elk across seasonal ranges during the proper season and may reduce the likelihood of wolves coming into contact with livestock on private lands. Ongoing livestock grazing on WWNF lands in the watersheds presents the potential for wolf-livestock interaction on these lands.

Figure wlf-1: Location of gray wolf packs as depicted on Oregon Department of Fish and Wildlife web site (15 October 2014).

FRINGED MYOTIS (*Myotis thysanodes*)

Fringed Myotis *(Myotis thysanodes)* occurs from sea level to 2,850 m but is most common at middle elevations 1200 to 2,100 m. Although the fringed myotis is found in a wide variety of habitats including desert scrub, mesic coniferous forest, grassland, and sage-grass steppe its distribution is patchy and it appears to be most common in drier woodlands (oak, pinyon-juniper, ponderosa pine). They roost in crevices in trees, snags, buildings, underground mines, rocks, cliff faces, and bridges. Roosting in decadent trees and snags, particularly large ones, is common throughout its range in western U. S. and Canada. Roosts have been documented in a large variety of tree species and it is likely that structural characteristics (e.g. height, decay stage) rather than tree species play a greater role in selection of a snag or tree as a roost. Recent research by Laki and Baker (2007) found snags are a less significant component of roosting habitat of fringed myotis in ponderosa pine forests on the east side of the Cascades (in OR and WA) than has been reported for the species in other regions of its distribution. However, they cautioned that it is unclear whether this is an actual preference for crevices in rocks by fringed myotis or represents a shortage of quality snags for roosting and warrants further study. Keinath, 2004, concluded that fringed myotis are found mainly in dry habitats where open areas are interspersed.

Weller and Zabel (2001) examined 52 roost sites in a Douglas-fir forest in northern California and found the following: all 52 sites were in snags; most were in snags greater than 12 inches in diameter; only decay class 2 and 3 snags were used; roost sites tended to be near stream channels; in at least fifteen of the sites the bats were roosting beneath the exfoliating bark. They also found that bats frequently changed roost sites. Although Lacki and Baker (2007) found that snags were not as important as previously reported for east of the Cascades, those that were used were larger in diameter and taller in height than random snags. Rabe et al. (1998) found that snags used for roosts were more likely to have exfoliating bark than random snags and concluded that snag roosting bats require higher densities of snags than cavity nesting birds.

Day roosts can differ from night roosts (Richardson 2002). Night roosts are used for resting between feedings and may be suitable locations for winter hibernation (Richardson 2002). Lacki and Baker (2007) found that roosts in the Pacific Northwest were normally within 1.4 km of a stream, likely because proximity to a water source influences the availability of an adequate prey base and offers hydration needed by maternity colonies with lactating females (Keinath 2004). The fringed myotis may roost with other bat species (O' Farrell and Studier 1980, Keinath 2004).

The greatest threat is human disturbance of roost sites, especially maternity colonies, through recreational caving and mine exploration ((Weller 2005); Arizona Game and Fish Department 1993, Keinath 2004). Other threats include closure of abandoned mines, renewed mining at historic sites, toxic material impoundments, pesticide spraying, vegetation conversion, livestock grazing, timber harvest, and destruction of buildings and bridges used as roosts (Weller 2005, Keinath 2004). Alteration/destruction or disturbance at roost sites can potentially cause bats to abandon the site (Keinath 2004). Changes in habitat that modifies microclimate in or near roosts may also impact bats (Richter et al. 1993).

The fringed myotis has been identified in the Lower Joseph Creek Watershed (Anderson 1998).

EFFECTS ANALYSIS

Alternative 1- The no action alternative would retain all trees and snags and would have **No Impact (NI)** on the fringed myotis.

Alternatives 2 and 3 (Discussion of these alternatives is combined because the effects would be similar) - Fringed myotis appear to be most common in drier woodlands roosting primarily in large trees and and snags. Alternatives 2 and 3 propose commercial harvest treatments on 15,900 acres and 10,300 acres respectively. Though snags are not prescribed for harvest, large snags will be removed due to safety and logging operations (e.g. skid trails), additionally in Alternative 2, the potential removal of large trees (>=21" dbh) may be removed. These large trees will result in a loss of potential roosting habitat. The road closures proposed in Alternative 2 will reduce the loss of future snag loss caused by firewood cutting and safety more than Alternative 3.

If large-diameter snags and trees are protected during fuel reduction (*see Mitigation Measures Wild1-13*), it is likely that thinning or prescribed fire may have minimal or even positive effects on bat populations depending on the starting conditions and management history of the site (Boyles and Aubrey 2006; Patriquin and Barclay 2003; Schmidt 2003). However, the loss of these habitat features may be detrimental to forest bat species (Chambers and others 2002).

Alternative 2 proposes more commercial harvest and more closure of open roads, while alternative 3 proposes less commercial harvest and maintanence of more open roads. With this taken into account, Alternative 2 and 3 **May Impact Individuals or Habitat (MIIH)** but are not expected to lead to a population decline of the species.

SPOTTED BAT (*Euderma maculatum*)

According to the Western Bat Working Group species account (Chambers and Herder 2005) the spotted bat has been found from below sea level to 2700 m elevation and occurs from arid, low desert habitats to high elevation conifer forests. Prominent rock features appear to be a necessary feature for roosting. This species has been found in vegetation types that range from desert to sub-alpine meadows, including desert-scrub, pinyon-juniper woodland, ponderosa pine, mixed conifer forest, canyon bottoms, rims of cliffs, riparian areas, fields, and open pasture. They appear to be solitary animals but occasionally roost or hibernate in small groups. Roost sites are cracks, crevices, and caves, usually high in fractured rock cliffs. In British Columbia and Arizona, bats showed high roost fidelity, using the same roosts nightly.

Winter range and hibernacula are unknown for most its range, though the species has been captured year-round in the southern part of its range and it may be year-round in central Oregon with the exception of December and January.

Little is known about possible threats to spotted bats because of the lack of knowledge concerning this species. Since the spotted bat roosts in remote locations, threats to roosts seem unlikely. However, recreational rock climbing may cause impacts in some areas. Dam construction that inundates high cliffs and canyons may remove roost locations. Loss of foraging habitat (grazing of meadows and desert-scrub, conversion of desert wash vegetation, or conversion of native grasslands to cheatgrass or other invasive species) may reduce food availability (Chambers et al. 2010). In the southwest, loss of accessible, open water that has been introduced in many areas for grazing livestock may impact bats because of the bats' high rates of evaporative water loss. As with most bat species, threats include habitat destruction or alteration, disturbance, sensitivity to pesticides and other pollutants, and overexploitation.

Chambers et al. (2011) explains that foraging areas could be affected by a variety of activities, including overgrazing that may reduce insects that these bats depend upon, loss of water sources such as livestock ponds during times of drought, and the development of wind-energy installations. Additionally in AZ, they found maternity roosts were remote, difficult to access and within protected areas thus not necessarily at risk.

No spotted bats have been recorded on the Wallowa–Whitman, however due to the lack of intensive bat sampling, it is possible that the spotted bat occurs in the Wallowa-Whitman.

EFFECTS ANALYSIS

Alternative 1, 2, and 3 (Discussion of these alternatives is combined because the effects would be similar)- None of the alternatives would affect potential roosting habitat and all riparian areas would be protected by a Riparian Habitat Conservation Area (RHCA). Because of these reasons, all alternatives would have **No Impact (NI)** on the spotted bat.

Townsend's Big-Eared Bat (*Corynorhinus townsendii)*

Townsend's big-eared bats have been reported from sea level to 3,300 meters in a wide variety of habitat types including coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types (Piaggio and Sherman 2005; Kunz and Martin 1982). Distribution is strongly correlated with the availability of caves and cave-like roosting habitat, including abandoned mines (Sherwin et al 2000; Pierson et al 1999; Gruver and Keinath 2006). Along the Pacific coast this species has been found roosting in buildings, generally in open attics (Brown et al. 1994; Pearson et al. 1952). Fellers and Pierson (2002) found males of this bat species roosting in a large hollow tree in the coastal area of California; although the majority of the bats they studied returned to the maternity roost- an abandoned building. Foraging associations include: edge habitats along streams, or adjacent to and within a variety of wooded habitats (Gruver and Keinath 2006). *Corynorhinus townsendii* is a moth specialist, with more than 90 percent of the diet consisting of lepidopterons (reviewed in Pierson et al. 1999).

C. townsendii populations appear to be quite sedentary, with marked animals (all females) not known to move more than a few kilometers from their natal roost. Banding, light-tagging and radio tracking studies suggest that movement in the nursery season, either for foraging or shifting to an alternate roost, is confined to within 15 km of the primary roost (Brown et al., 1994; Pearson et al., 1952; Humphrey and Kunz, 1976). Seasonal movements also appear to be limited with hibernacula usually located within 3 to 64 km from their summer roosts (Gruver and Keinath 2006).

Townsend's have been noted foraging in a wide variety of habitats (Pierson et al. 1999) throughout its western range, and this may reflect the need to roost where structures are available as opposed to within a particular vegetative zone (Gruver and Keinath 2006). Suitable foraging habitat is likely to be a heterogeneous mosaic of forested and edge habitats, including riparian zones, which are also used for commuting and drinking (Fellers and Pierson 2002).

According to Piaggio and Sherman (2005) the primary threat is almost certainly related to disturbance and/or destruction of roost sites (e.g., recreational caving or mine exploration, mine reclamation, and renewed mining in historic districts). It is well documented that *C. townsendii* maternity colonies are highly sensitive to human activities, and that even modest disturbance can lead to roost abandonment (Pearson et. al 1952; Humphrey and Kunz 1976; Pierson and Rainey 1996; Gruver and Keinath 2002). Roads may indirectly affect bat species by increasing human access to roost sites.

Loss or modification of foraging habitat can also be detrimental (Gruver and Keinath 2002). Townsends do not use large clear-cuts or regenerating stands. Activities that reduce the productivity of riparian areas probably impact Townsend's by reducing prey availability and drinking sites.

The Townsend's big-eared bat is known to occur in abandoned mines and caves in several areas across the forest. In particular these bats have been found along the Snake and Imnaha Rivers.

Determination of Effects

A 1989-1990 survey of 14 localities in Oregon and Washington indicated that over a 5-year period populations rapidly decreased at 8 sites; 6 populations, receiving moderate to high protection, were stable or increasing (Perkins 1990). A 1994 survey of one Oregon locality indicated a decline in 4 of 5 caves (Perkins 1994). A survey by Anderson (1998) located this bat within the Lower Joseph Watershed.

No management activities are proposed in any of the alternatives at potential caves or mines within any of the alternatives. Although treatment is anticipated within foraging habitat for this species, it is to be undertaken with the intent of restoring vegetation to what was expected to occur historically. For these reasons Alternatives 2 and 3 **May Impact Individuals or their Habitat (MIIH)** but are not expected to lead to a decline in the population of the species.

JOHNSON'S HAIRSTREAK (*Callophrys johnsoni)*

These butterflies occur within coniferous forests which contain the mistletoes of the genus *Arceuthobium*, commonly referred to as dwarf mistletoe. These plants are highly specialized and are known to occur on a number of different conifers (Schmitt and Spiegel 2008). Old-growth and late successional second growth forests provide the best habitat for this butterfly, although younger forests where dwarf mistletoe is present also supports *C. johnsoni* populations (Larsen et al. 1995; Miller and Hammond 2007, LaBonte et al. 2001). Older coniferous forests, especially those with a heavy component of western hemlock (*Tsuga heterophyla*) that are infected by dwarf mistletoe (*Arceuthobium tsugense*) appear to be its key habitat (Andrews 2010a, Miller and Hammond 2007, Larsen et al. 1995). In Washington, it is only know to occur west of the Cascade crest (Larsen et al. 1995). A disjunct population occurs at the Oregon/Idaho border in Baker and Union counties, Oregon and Adams County, Idaho (see map below). This disjunct population may be a relict population isolated by climate changes (Davis et al. 2011).

The primary host trees for dwarf mistletoes associated with *C. johnsoni* presence are western hemlock (*Tsuga heterophylla*), white fir (*Abies concolor)* and Ponderosa pine (*Pinus ponderosa*). Dwarf mistletoe can occur on all age classes of forest (Muir and Hennon 2007), but is most abundant in mature stands and old-growth. Adult Johnson's Hairstreaks are seldom seen, perhaps because they spend most of their adult life high in the forest canopy (Davis et al. 2010).

The Johnson's hairstreaks in the Cascades, Sierras and on the coast have been found feeding on dwarf mistletoe of mountain hemlock and digger pine (Shields 1965), while those found in northeastern Oregon have been found feeding on western dwarf mistletoe (*A. campylopodum*) on ponderosa pine (McCorkle 1973 *in* Davis and Weever 2011).

Habitat destruction could have a negative impact upon this species of butterfly (Larsen et al. 1995). It has been speculated that old growth forests are particularly suitable to this species of butterfly, although *Arceuthobeium* mistletoes also occur in younger forests as well where there is an absence of recent large scale disturbance (Schmitt and Spiegel 2008). While much of the literature indicates that this butterfly is dependent on large, old, closed-canopy old-growth (Miller and Hammond 2007; Pyle 2002), this is based on collections and sightings in the moist fir/hemlock forests of the Cascades and West Coast. Forests providing western dwarf mistletoe (*Arceuthobium campylopodum*) habitat in the Blue Mountains are typically open to provide sun that allows ponderosa pine to regenerate.

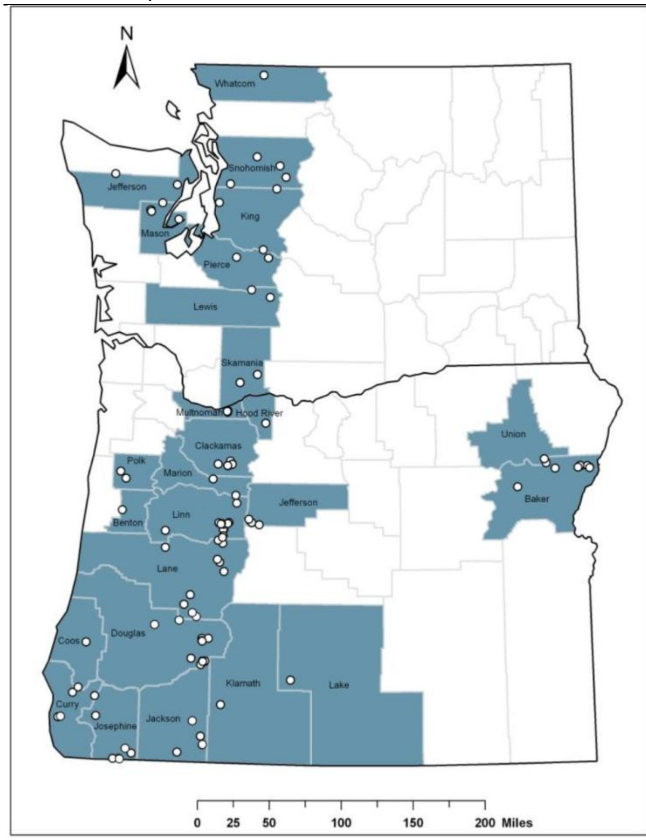

Figure 1: Current known geographic distribution of Johnson's Hairstreak butterfly (*Callophrys johnsoni*) records in Oregon and Washington (all records dating back to 1891).

Effects Analysis

Although some reduction in dwarf mistletoe occurrence has occurred due to logging, infected conifers are still common in northeastern Oregon, and current dwarf mistletoe levels are not believed to be substantially less than historic levels in this area (Schmitt and Spiegel 2008). All alternatives have the desired condition to move towards HRV. This includes disturbance factors such as insects and disease occurrence as well as forest age and structure. Because alternatives 2 and 3 emphasize the restoration of ponderosa pine there is the possibility of reducing potential habitat for this species by removing Douglas-fir and grand fir that have encroached on ponderosa pine sites.

Alternative 1 – Under the no action alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. In the absence of fire, the abundance of mistletoe would likely increase in the short to mid-term, thus creating more larval host plants for the Johnson's hairstreak. Under this alternative, the risk of stand-replacing fire would continue to increase, potentially reducing available habitat for this species. For these reasons Alternative 1 **May Impact Individuals or their Habitat (MIIH)** but is not expected to lead to a decline in the population of the specie.

Alternatives 2 and 3 – Under Alternatives 2 and 3, the harvest of trees from 4,690 acres and 3,360 acres respectively, of OFMS likely would directly impact Johnson's hairstreak by removing trees with mistletoe and potentially killing larvae should they occur within the project area. These alternatives may also indirectly impact Johnson's hairstreak by reducing the available amount of larval host plants. However, mistletoe is abundant within the project area and the level of harvest proposed in Alternatives 2 and 3 will not significantly reduce the availability of host plants for this species. For these reason, Alternatives 2 and 3 **May Impact Individuals or their Habitat (MIIH)** but are not expected to lead to a decline in the population of the species.

INTERMOUNTAIN SULPHUR (*Colia Christina pseudochristina)*

The Intermountain sulphur butterfly inhabits open woodland from 3400 to 5000 ft., including meadows, roadsides, and open forest. Warren (2005) states that members of this subspecies are most often found on steep sunny slopes at the ecotone between forest and shrubsteppe or grassland habitats. It is found from the eastern Blue Mountains in Washington, through the Blue and Ochoco Mountains in Oregon and there have been numerous sightings in the Wallowa Mountains.

Loss of habitat due to agricultural conversion and development are the primary threats to this species with pesticide use as a close second. The larvae feed on plants in the pea family, while the adult's nectar on many flowers but are known to feed on thistles, dogbane and milkweed. The adult intermountain sulphur is a strong flier and so can find dispersed flowers. 3rd instar larvae overwinter in a folded leaf of the larval food plant (Personal communication, Blue Mountains Pest Management Service Center).

EFFECTS ANALYSIS

Alternative 1- Under the no action alternative, the risk of uncharacteristic wildfire and insect/disease outbreak would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. However if tree stands were lost through insect/disease/fire the loss of trees would not impact the life cycle of this butterfly and so there would be **No Impact (NI).**

Alternatives 2 and 3 (Discussion of these alternatives is combined because the effects would be similar)- Alternatives 2 and 3 both propose to burn more than 45,000 high priority acres though not all acres will be burned at once. It is expected that implementation of the prescribed fire will take place over an at least 10 year time span. This has the potential to eliminate food plants and insects in those areas but also increase the viability of food sources in the coming years and renew flowering plants as long as the diversity of unburned and burned areas is retained. For these reasons Alternatives 2 and 3 **May Impact Individuals or their Habitat (MIIH)** but are not expected to lead to a decline in the population of the species.

WESTERN BUMBLEBEE (*Bombus occidentalis*)

The Western bumble bee is rare throughout much of its range and is in decline. Historically is was found from the Pacific coast to the Colorado Rocky Mountains but has seen severe population decline west of the Sierra-Cascade Crest. It is known to feed on sweet clover, rabbit brush, thistle, buckwheat and clover (Koch et al 2011).

There are a number of threats facing bumble bees which include; the spread of pests and diseases by the commercial bumble bee industry, other pests and diseases, habitat destruction or alteration (agriculture, urban development, grazing), pesticides and invasive species. The invasiveness and dominance of native grasslands by exotic plants may threaten bumble bees by directly competing with the native nectar and pollen plants that they rely on. In the absence of fire, native conifers encroach upon many meadows, which removes habitat available to bumblebees.

EFFECTS ANALYSIS

Alternative 1 – Under the no action alternative there would be an absence of fire on the landscape except for the case of a stand replacing fire due to high stocking levels and high fuel loads. In the absence of fire, native can encroach on meadows, removing bumblebee habitat. Because of this, Alternative 1 **May Impact Individuals or Habitat** (**MIIH**) but is not expected to lead to a decline in the population of the species.

Alternatives 2 and 3 (Discussion of these alternatives is combined because the effects would be similar)- Prescribed burns planned in Alternative 2 and 3 have the potential to eliminate food plants and overwintering insects, however burning an area also has the potential to renew flowering plants as long as diversity of unburned and burned areas is retained. Alternative 2 and 3 plans burn blocks on 7,465 acres. This has the potential to eliminate food plants and insects in those areas but also increase the viability of food sources in the coming years. Additionally, prescribed fire will reduce the encroachment of overstocked stands onto bumblebee meadows. For these reasons Alternatives 2 and 3 **May Impact Individuals or their Habitat (MIIH)** but are not expected to lead to a decline in the population of the species.

No potential habitat and therefore potential effects from the proposed actions for the following species:

SILVER –BORDED FRITTILLARY (*Boloria selene*)

YUMA SKIPPER (*Ochlodes yuma*)

BUFFLEHEAD

PART 3 – Regulatory Framework/ methods/project design critera/ literature cited

Regulatory Framework

The three principle laws relevant to wildlife management are the National Forest Management Act of 1976 (NFMA), the Endangered Species Act of 1973 (ESA), and the Migratory Bird Treaty Act (MBTA) of 1918 (as amended). Direction relative to wildlife is as follows:

- NFMA requires the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native vertebrate wildlife species and conserve all listed threatened or endangered species populations (36 CFR 219.19).
- ESA requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the US Fish and Wildlife Service if a proposed activity may affect the population or habitat of a listed species.
- MBTA established an international framework for the protection and conservation of migratory birds. This Act makes it illegal, unless permitted by regulations, to “pursue, hunt, take, capture, purchase, deliver for shipment, ship, cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird.”

Forest Service Manual (FSM) direction provides additional guidance: identify and prescribe measures to prevent adverse modifications or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened and proposed species (FSM 2670.31 (6)).

The Forest Service Manual also directs the Regional Forester to identify sensitive species for each National Forest where species viability may be a concern. Under FSM 2670.32, the manual gives direction to analyze, if impacts cannot be avoided, the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole.

The principle policy document relevant to wildlife management on the Forest is the Wallowa-Whitman Land and Resource Management Plan (USDA Forest Service 1990), referred to as the LRMP for the remainder of this analysis. The LRMP provides standards and guidelines for management of wildlife species and habitats. Standards and guidelines are presented at the Forest level (LRMP, pp. 4-18 to 4-56) or Management Area level (LRMP pp. 4-56 to 4-98).

The 1995 Regional Forester’s Eastside Forest Plan Amendment #2 (Eastside Screens) amended Forest Plans for the National Forests in Eastern Oregon and Eastern Washington, including the Wallowa-Whitman National Forest. Amendment # 2 established interim wildlife standards for old growth, old growth connectivity, snags, large down logs, and northern goshawks. The Regional Forester has periodically distributed letters clarifying direction in Amendment #2 (Regional Forester, October 2, 1997; October 23, 1997; and June 11, 2003).

Additional management direction is provided for the conservation of migratory landbirds. This direction is consolidated in the Forest Service Landbird Strategic Plan and further developed through the Partners in Flight Program. The Oregon-Washington Partners in Flight Conservation Strategy for Landbirds in the Rocky Mountains of Eastern Oregon and Washington (Altman 2000) identifies priority habitats, and focal species and habitats for the Blue Mountains of Oregon.

Management Direction: Management direction for the planning area is found in the Land and Resource Management Plan for the Wallowa-Whitman National Forest (Forest Plan; 1990). The management areas (MA) within the Lower Joseph project area are:

Table 23: Forest Plan Management Areas within the LJCRP boundary.

Forest Plan Management Area	Acres
1 - Timber Production Emphasis	28,100
3 - Wildlife/Timber	35,400
7 - Wild and Scenic Rivers	2,200
9 - HCNRA Dispersed Recreation/Native Vegetation	5,000
10 - HCNRA Forage Production	14,100
11 - HCNRA Dispersed Recreation/Timber Management	8,900
12 - Research Natural Areas	760
15 - Old Growth Preservation	3,100
Grand Total	**97,560**

MA-1 – Timber Production; MA-1 allows for timber management designed to emphasize wood fiber production. Short-term cover shortages would reduce habitat quality in some areas; at least 30 percent of the forest land would be maintained as cover.

MA-3 –. Winter Range; MA-3 allows for timber management designed to provide near-optimum cover and forage conditions on big game winter ranges. Timbered areas are a mosaic of even-aged stands and are dispersed to provide a mixture of forage areas, satisfactory cover, and marginal cover. Regenerated trees must be ten feet tall before harvesting adjacent units. Harvest is done to achieve optimum distribution of cover elk. Open public road access is generally not more than 1.5 miles per square mile to maintain habitat quality.

MA – 7 – Wild and Scenic Rivers; Management is intended to preserve the special values of those rivers or river segments (meaning the river plus its associated corridor) which are part of the National Wild and Scenic Rivers System.

MA – 9 - HCNRA Dispersed Recreation/Native Vegetation; In these areas all activities will be managed to provide ample opportunities for dispersed recreation and to enhance native vegetation. There will be no regulated timber harvest, however, measures necessary to protect timber on other public or private lands from disease or insects are permitted.

MA-10- HCNRA Forage Production; tThe grassland portions of these areas will be managed to provide maximum forage production with ranges maintained in satisfactory condition (desired ecological status) and structural improvements being rustic in nature Timber will be managed to maintain old-growth.

MA-11 - HCNRA Dispersed Recreation/Timber Management; these areas combine dispersed recreation with timber management on the more productive siteswithin the NRA The objective is to provide avariety of tree species, a diversity of healthy timber stands and ample dispersed recreation opportunities.

MA-12 – Research Natural Areas; the objective is to maintain the natural condition of the areas

MA-15 –Old Growth Preservation; MA-15 is intended to provide old growth habitat for wildlife. Evidence of human activities may be present, but do not significantly alter old growth features.

Analysis Methods

Two different scales of analysis are used in this document to analyze the effects of the treatment activities on wildlife, and include the following:

• Lower Joseph Creek Project Area of 97,560 acres on National Forest System lands.
• The cumulative effects area encompassing the Lower Joseph Project includes all of the Wallowa-Whitman NF.

The project area boundary occurs on FS lands predominately within the Upper Joseph Creek Watershed and the Lower Joseph Creek Watershed and includes 10 sub-watersheds (5^{th} field).

The existing condition is described for each species, group of species, or habitat. Direct, indirect and cumulative effects of alternatives are identified and discussed. Incomplete or unavailable information, scientific uncertainty, and risk are disclosed where applicable.

Alternative 1, the No Action Alternative, is required by NEPA. It is used as a benchmark to compare and describe the differences and effects between taking no action and implementing action alternatives. The No Action Alternative is designed to represent the existing condition; resource conditions are then projected forward in time to estimate resource changes expected in the absence of the proposed management activities.

Effects on species will be determined by assessing how the No Action Alternative and action alternatives affect the structure and function of vegetation relative to current and historical distributions. Some wildlife habitats require a detailed analysis and discussion to determine potential effects on a particular species. Other habitats may either not be impacted or are impacted at a level which does not influence the species or their occurrence. The level of analysis depends on the existing habitat conditions, the magnitude and intensity of the proposed actions, and the risk to the resources.

Analysis Tools and Surveys

Species presence/absence determinations were based on habitat presence, past wildlife surveys, recorded wildlife sightings, the Oregon Natural Heritage Information Center wildlife sightings database (2008), scientific literature, and status/trend and source habitat trend documented for the Interior Columbia Basin (Wisdom et al. 2000) and the viability analysis completed by Wales et al. (2012) for the Forest plan revision.

Vegetation analysis and estimates of stand conditions were completed using silviculture analysis tables, results described within the Lower Joseph Creek Vegetation Management Report, aerial photo interpretation, vegetation database, and/or ground reconnaissance. In the summer of 2014, a wildlife survey focusing on locating Northern goshawks in historical locations was conducted. Additional to locating goshawks, other species were also documented including pileated woodpeckers, and flammulated owls.

Habitat and Predicted Climate Trend

Gecy (2009) reviewed climate data for the Blue Mountains, and reports that the most notable trends consist of decline in winter precipitation and increase in winter and spring temperatures, are the most notable features of the data reviewed. The assessment states that continuation of these two trends could result in a number of potential adverse effects, including, but not limited to:

- Continued increase in the percentage of winter precipitation that occurs as rain, rather than snow.
- Earlier snowmelt.
- Extended growing seasons, resulting in lower soil moisture, and increased late-season moisture stress on vegetation.
- Earlier and longer fire seasons and higher likelihood of severe fire behavior.
- Changes in vegetation patterns, species distribution, and species composition, and corresponding changes in the composition and distribution of wildlife habitats.
- Changes in the seasonal distribution of streamflow.
- Increased potential for higher flood peaks as well as more extended droughts.

Initial examination of available data indicates that changes in temperature and precipitation are not occurring evenly within the Blue Mountains (Gecy 2010). Direct and indirect effects of the long-term changes listed above are, therefore, uncertain due mainly to variations in climate trend at the local level. Generalized implications to species' habitats in Snow Basin are provided below.

For species known to PETS and MIS species known to occur or potentially occurring within the project area, the environmental implications listed above could mean long-term decreases in habitat available to species associated with alpine environments, as well as subalpine, and mesic forest associations. The list of species would include California wolverine, American marten, and three-toed woodpecker. As available moisture decreases and average temperatures increase, available snowpack may decrease, which could impact the wolverine by decreasing denning habitat, food sources, and dispersal ability (Brodie and Post 2010). The trend may also suggest a decrease or elevational shift in availability of mesic forest stands due to decreased moisture and increased potential for severe fire behavior.

Under alternative 1, no proposed management activities would occur. Current condition of habitats within the project area in warmer and drier biophysical settings is moderately or highly departed from historical condition, with increased risk to uncharacteristic disturbance events. Long-term decrease in available moisture and increase in susceptibility to disturbance increases risk and decreases potential for sustainability of green overstory forest components that provide habitat for most species considered in this analysis.

All action alternatives would reduce risk of disturbance, limit the extent and severity of future disturbance, and allow maintenance of these conditions with periodic fire. Tree species composition and stand/landscape structure at reduced densities creates favorable conditions now and for the predicted warmer and dryer climate (see Silviculture Report). Long-term sustainability of habitats for species relying on green forest vegetation in open and moderately-dense condition would be favored if these conditions are maintained through time. Density reductions and prescribed fire treatments would reduce susceptibility to large-scale disturbance, at least in the short-term (20 years), creating potential long-term reductions in habitats available to species associated with disturbance events, particularly black-backed woodpecker. Long-term response of habitats is difficult to predict and would largely depend on the amount of forested area treated in future decades to maintain lower risk to disturbance.

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APPENDIX – Project Design Criteria

Lower Joseph Restoration Wildlife Project Design Criteria (22June, 2015)

Wildlife

Unless noted, Design elements apply to Alternatives 2 and 3.

<u>Trees</u>

Wild – 1

No harvest of trees >=21” dbh within MA15s, Goshawk PFA’s (map provided and or newly found sites), moist forest, large tree (>=20” dbh), closed-canopied (>60%) forests (marten habitat).

Wild – 2

Trees with stem damage, heavy stem decay, poor form, broken tops, numerous large branches, or other characteristics that make them unsuitable for commercial products would be retained for wildlife habitat when available, in the longer term, these trees may become quality snag habitat. Consider skips, or the design of ‘clumps’ in thinning units to avoid thinning in vicinity of these unique trees

Wild - 3

No harvest of trees >=21” dbh (Alternative 3).

Wild - 4

Retain designated leave trees damaged during logging operations in harvest areas, unless determined to be a safety hazard.

Snags

Wild – 5

Retain all snags (dead trees) during harvest and stand improvement treatments except where they create and operational constraint (skid trail or skyline corridor) or an imminent operational safety hazard. Consider using skips, or the design of ‘clumps’ in the harvest units to avoid thinning in the vicinity of snags.

Wild – 6

Removal of danger trees within the RHCAs, Dedicated Old growth (MA15s), Goshawk PFAs and Marten habitat areas is restricted. When felled from within these dedicated areas, only that portion of the tree within the roadway of the road can be removed. Danger tree determinations would meet Forest Service Danger Tree Policy and Guidelines.

Wild – 7

Utilize prescribed fire lighting techniques to help retain all snags during prescribed burning operations. Larger snags are of great value to primary cavity excavators and not easily replaced if loss occurs due to burning.

Wild – 8

For larger snags (> 20 inches DBH) at higher risk due to heavy fuels accumulations at the base, pullback of fuels or alteration of lighting techniques may be necessary prior to prescribed burning.

Wild – 9

In moist forests, because we are deficient in large snags, and in areas with known pileated woodpecker nests, prior to prescribed burning, rake duff away from the base of large live old growth trees and large snags with accumulations of bark and duff and/or use other protection measures where economically viable and reasonable to do.

Wild – 10

Prescribed burning during active nesting period (e.g. May 20 or post leaf-out) for nesting landbirds will be coordinated with district or forest biologist.

Wild – 11

Road Management - To retain snags and reduce disturbance, currently closed roads that are needed for log haul, and other road closures included within the ROD, would be closed immediately after project implementation (harvest/thinning, and pile burning).

Down Wood, Woody Debris, and Large Logs

Wild – 12

In all treated areas the minimum woody-debris ground cover listed in Table WL-1 below would be retained through all phases of the project where they currently exist. Existing large down logs (logs greater than 12”) would be retained during harvest and grapple piling activities. Standing dead trees within thinning units that present a safety hazard would be felled and left in place if the unit is deficient in woody debris.

Wild – 13

As part of the plan for retention of logs and snags, protection measures shall be used during prescribed underburning to reduce consumption of these large woody fuels needed for wildlife habitat and hydrologic stability.

Wild – 14

Large snags (>20” dbh) felled for safety reasons in RHCAs, MA15s, Goshawk PFAs, and marten habitat will be retained on site to contribute to coarse wood. During any prescribed burning, the objective is to retain these logs, use burning techniques that support retention of these structures.

Table WL-1 Forest Plan Standards for Down Woody Debris

Species	Pieces per acre	Minimum Diameter at Small End (inches)	Minimum Piece Length	Total Length feet/acre
Ponderosa Pine	3-6	12”	greater than 6 feet	20-40 ft.
Mixed Conifer	15-20	12”	greater than 6 feet	120-160 ft
Lodgepole Pine	15-20	8”	greater than 8 feet	120-160 ft

Goshawk

In order to meet Regional Forester’s Eastside Forest Plans Amendment #2, Goshawk Standards, the following measures would be applied:

Wild – 15

Protect known active and historically used (known nesting activity occurring at the site within the last five years) goshawk nest site from disturbance. Defer harvest from 30 acres of the most suitable nesting habitat surrounding all active and historical nest trees.

Wild – 16

Within the 6 mapped goshawk PFAs, no harvest in stands that are currently providing LOS source habitat for goshawks (>=20”dbh and canopy closure >=50% in the dry and >=60% in the moist).

Wild – 17

If a new goshawk nest site is located during monitoring (see Goshawk Monitoring) or sale preparation, the site would be protected by eliminating harvest on 30 acres of the most suitable nesting habitat around the nest site. A 400 acre post fledging area would be designated around the core nest area (if not already designated). Proposed harvest activities that move young stands toward a late old structure condition could occur. Late and Old (LOS) stands would be retained per Regional Foresters Amendment #2 (Senario A). Activities in the post fledging area would apply recommended guidelines for structural composition as described in Reynolds et al. 1992.

Wild – 18

No harvesting of trees >=21” dbh within PFAs, unless a safety hazard. If trees of snags felled for safety purposes, retain them on site for down wood.

Wild – 19

Restrict project activities within ½ mile* of an active goshawk nests between April 1 to August 31 to avoid possible disturbance of goshawk pairs while bonding and nesting. Prohibited management activities include all Forest Service and contracted activities, including but not limited to, such activities as timber harvest, non-commercial thinning, prescribed fire, and roadwork.

*In site-specific cases, the ½ mile distance may be reduced to ¼ mile along frequently traveled roads that would be used for haul routes, where the birds are habituated to traffic, or where topography and vegetation provide a buffer for noise disturbance. Consult District wildlife biologist for direction. Burning operations, non-commercial thinning operations in vicinity of post-fledgling area would generally require the ½ mile buffer.

Wild – 20

In the areas that are not providing LOS source habitat, within PFAs, the intent is to enhance stands toward LOS habitat: the objective is to move young stands toward a late old structure. To the extent possible, retain multi-story characteristics, vegetation complexity, large snags, and large down logs. Consider designing unthinned patches (skips) near riparian, springs or seeps, as these can be favored by goshawks for nesting

Wild – 21

Closed roads within goshawk territories that have grown in with thickets would be maintained in an undriveable state. Non-commercial thinning crews would leave sufficient clusters of trees along these roadbeds to prevent any vehicle access.

Wild – 22

Protect trees and snags >=20" during prescribed fire operations using a number of methods including but not limited to raking, pull back, and altering ignition patterns to minimize loss of these structures within PFA.

Wild – 23

A map including the nest areas, post-fledgling areas, and ½ mile restricted disturbance area (April 1-September 30) will be provided to the purchaser.

Marten

Wild - 24

Because marten habitat is at the lower end of the RV, any harvesting within marten habitat (moist forests, large tree, closed canopy) is designed to maintain old forest characteristics. Canopy closure will remain >=60%, and no harvest of trees >=21" dbh in marten habitat. Maintain snags and large down wood that American marten need for denning, rest areas, and hunting. Large broken top and potentially hollow grand fir would be maintained for denning habitat.

Other Raptors / Pileated woodpeckers

Wild – 25

Contact district wildlife biologist for up-to-date raptor nest locations and activity status before implementation of management activities.

Wild – 26

To conserve nesting habitat of raptors or pileated woodpecker, consult the wildlife biologist to establish a nest zone buffer around any new, or existing, nests discovered prior to or during project layout and implementation and, if appropriate, to restrict activities within the nest area during occupancy, according to requirements of the species involved.

Wild – 27

Protect known (and active) pileated woodpecker nests during all harvest or prescribed burning activities. Maintain a no-cut buffer within 50 feet. Protect nest tree through the use protection measures such as raking and lighting techniques during prescribed burning.

Wild – 28

Raptors are particularly sensitive to disturbance during the reproductive season. Table WL-2 displays seasonal restrictions and nest protection standards for raptor species with known nest sites in or adjacent to the project area. Effects to species can vary depending on the loudness and duration of the management activity and the topographical or vegetation screening between the management activity and the nest tree. This EIS permits waiver or adjustments to seasonal restrictions if recommended by the District wildlife biologist and approved by the District Ranger.

Table WL-2Summary of Raptor Timing Restrictions

Description	Timing-Activities Prohibited	Buffer for Timing-Activities Permitted	Timing – Activities Permitted	Management Restrictions At All Times
Occupied goshawk nest sites	Activities are prohibited: April 1 - August 31.	Within ½ mile of nest sites	Activities can occur: October 1- March 31	No management within nest stands
Occupied raptor nest sites	Activities are prohibited: March 1 – July 31	Within 660 feet	Activities can occur: August 1- February 28	No management within 100 feet of nest tree

Big Game

Wild - 29

Provide hiding cover in accordance with forest plan standards and guides by retaining non-thinned patches of t trees throughout the stand. Avoid placing 'openings' along more heavily used open roads. Areas more critical for hiding cover include flat topography, along main roads (eg. FS 46, FS 4602, FS 4605, FS 4615, FS 4650, FS 4655, FS 4680), and along fringes of meadows. Hiding cover is defined as vegetation capable of hiding 90 percent of a standing adult deer or elk from human view at 200 feet.

Wild - 30

Winter Range (MA 3): Limit activities associated with this EIS that have the potential to disturb wintering big game. Coordinate seasonal operating restrictions with wildlife biologist if necessary.

Wild – 31

Known calving/fawning areas: Restrict timber harvest, non-commercial thinning, prescribed fire and road work from May 1st to June 30th. In areas not specifically identified for calving and fawning, instruct crews to watch for lone elk or deer. If crews see lone animals, they would search the immediate area for calves and fawns and avoid felling trees or igniting prescribed fire where young animals are discovered.

Connectivity

Wild – 32

To maintain wildlife connectivity corridors in the Dry Forest treatment units maintain >=40 canopy closure. In the Moist Forest connectivity treatment units maintain >=50% canopy closure. (Connectivity corridors have been mapped, a map will be provided to the purchaser)
Roads

Threatened, Endangered and Sensitive Species.

Wild – 33

To prevent spread of diseases to amphibians including Columbia spotted frog and Rock Mountain tailed frog, gear, hoses and dipping buckets used to transport or move water from streams, rivers, or ponds needs to be disinfected by drying in the sun (must be completely dry inside and out) or washing with a chemical disinfectant before changing to a different water source